

Top CD-RW Drives • WinMe's RESTORE Utility • MS Office 2001

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In Plain English

April 2001 Vol. 12 Iss. 4 \$4.95 U.S. \$6.50 Canada



Top Tips

From Our Labs

We Look At **1,000s** Of PC Products Each Year.
Here Are Some Things We've Learned About:

- Setting Up New Systems
 - Installing New Devices
 - Working With Hard Drives
 - Using Digital Cameras
 - Getting Printers To Print
 - Tweaking Sound & Video Cards
- & More**

The Latest
**Storage
Devices**

How To
Set Up A
Wireless Network

Decipher
Internet Payment
Systems

Why
Moore's Law Works



eMail

▼ 1 new message

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i fought bad guys.
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i want to play.

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Reply

Save



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Web Site Tip Of The Month ...

Side-By-Side Product Comparisons—The Hardware Reviews & Comparison Charts area includes reviews of dozens of the latest products from top-name manufacturers. Simply click the product category and subcategory that interest you. From there, find the products you want to compare and click the box in the Chart column. Once you've selected all the products you want (up to a maximum of five), click Create Chart at the bottom of the page. Access a product's full review by clicking the product name at the top of the chart.

Upcoming Special Smart Computing Issues Available On Newsstands ...



Guide Series - PC Today:

Internet Tips/ Shareware Utilities/ Notebooks

We reveal handy Internet usage tips, uncover great freeware and shareware utilities, and review notebooks.



Learning Series: PC Fixes

Check out our quick troubleshooting tips for hardware components and the Windows 95/98 and Windows Me operating systems.



Reference Series:

How The Internet Works

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editor@smartcomputing.com
FAX: (402) 479-2104
131 W. Grand Drive
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CORRECTIONS/ CLARIFICATIONS

Our March 2001 New Products section (page 11) erroneously listed Quicken TurboTax 2000 as selling for \$19.95. It's \$29.95.

In the "Create Redirects If You Move Your Site" sidebar on page 87 of the March 2001 issue, the line
equiv="refresh" content="1",
should end with a semicolon
(;) not a comma;
equiv="refresh" content="1";

New Web-Only Articles

Access these articles by typing <http://www.smartcomputing.com/Apr01/> into your browser and adding the bold text after each article summary.

Reviews

Hardware

Notebook: WinBook's WinBook Si 800 (See [winbook](#).)

Laser Printer: Panasonic's Office KX-P7510 (See [panasonic](#).)

Software

Organizer: Spud City Software's Desktop Dozen 1.6 (See [spud](#).)

PC Operating Instructions

The Big Upgrade

The long-awaited official version, 2.4, of the Linux kernel is here, and we'll walk you through downloading, compiling, and configuring it to your system. (See [kernel](#).)

PC Conversations

Libraries & e-Texts Seem To Click

netLibraries' Rich Rosy tells us about checking out virtual texts from actual libraries. Rosy looks at the future of e-books and talks about their many advantages. (See [e-books](#).)

Master The Web

Become Your Own Postmaster With Stamps.com

Bypass lines and long waits at your local U.S. post office by buying your postage online and printing it off, day or night, in your small- or home office. (See [stamps](#).)

Quick Studies

HTML: Using Color (See [html](#).)



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Mini DV

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High-Tech Truce

Computers have a big impact on most people's lives, whether through direct or indirect means. Most of the effects of technology are positive: higher productivity, fewer menial tasks to perform, and access to more information than most people will ever need. Because they have so much influence, however, computers can be equally burdensome when they don't work like they should.

Minor problems like work interruption and bank errors are bad enough; most people have become so accustomed to them that they often shrug such occurrences off, accepting them as a necessary evil. But computer problems can potentially be quite serious, affecting air traffic control systems or costing businesses millions of dollars. For years the computer industry seemed willing to accept bugs and glitches as a matter of course, but a new organization called the High Dependability Computing Consortium (HDCC) appears finally to have drawn a line in the sand.

Scholars have been proposing a partnership between universities, government agencies, and rival technology companies as a way to deal with computer problems for some time. Then James H. Morris, Dean of the Carnegie Mellon School of Computer Science, outlined the need for the HDCC in an essay published last April and updated on Dec. 9. In the paper, Morris pointed out that computers must become more reliable if people are to trust their lives,

health, and financial well-being to them in the 21st century and beyond. He offered last year's Y2K scare as an example of both how much we depend on computers and how much the industry can achieve when it dedicates the money and effort.

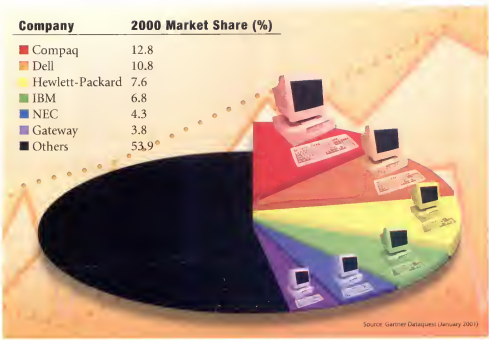
Apparently the idea has struck a chord within and around the technology community. Last August Carnegie Mellon and NASA reached a deal to create a branch campus at the agency's Ames Research Center in

Moffett Field, Calif., and NASA committed \$550,000 to help fund the HDCC. On Dec. 11, Carnegie Mellon and the agency formally announced its formation along with 12 influential hardware and software companies, including IBM, Hewlett-Packard, Compaq, Microsoft, and Sun Microsystems. The consortium held its first sessions Jan. 10-12 and will initially focus on issues such as air traffic control, Internet communication, and health care.

Cutting The PC Pie

The annual growth of PC sales slowed in 2000 but the industry still managed to ship 134.7 million units worldwide, or 14.5% more than in 1999. The biggest single share of the market went to Compaq, while Hewlett-Packard's 34.7% increase in unit sales helped it grow from a 6.5% worldwide market share in 1999 to 7.6% in 2000.

Company	2000 Market Share (%)
■ Compaq	12.8
■ Dell	10.8
■ Hewlett-Packard	7.6
■ IBM	6.8
■ NEC	4.3
■ Gateway	3.8
■ Others	53.9



Source: Gartner Dataquest (January 2001)

Apple Takes A Bite Out Of DVD

In January, Apple Computer fired the latest salvo in its ongoing battle for market share at its MacWorld Expo in San Francisco. The company announced that its newest Power Mac G4 computers would ship with new Pioneer SuperDrives that can read and write CD-Rs (CD-recordable) and DVD-Rs (DVD-recordable). The most exciting news, though, is that they can also create professional-quality movie discs users can play in their home DVD players in conjunction with a new software product Apple calls iDVD.

With iDVD you can drag and drop iMovie files (that you take with a digital camcorder), QuickTime movies, and slide shows into a project interface where you can arrange them and add music or voiceovers. You can preview your work on-screen, and when your masterpiece is



complete iDVD burns your project onto a DVD-R that you can watch on your computer or your home theater system.

This technology is great for aspiring directors as well as home movie buffs that want to share their creative vision. You can bet PC users will have access to similar technology before long, but in the meantime it could provide a shot in the arm for Apple.

Early Warning

A new technology developed by Lawrence Livermore National Laboratory and San Jose-based Bioluminate may soon help doctors detect breast cancer earlier, more accurately, and more comfortably. It's called the Smart Probe, and it will enter the human test phase this spring at selected sites in Northern California.

Using the Smart Probe, doctors insert a small needle into areas of concern, and tiny optical, electrical, and chemical sensors simultaneously check the tissue for several breast cancer indicators. The procedure is considerably less invasive than traditional biopsy procedures, and its

developers believe that in addition to providing more accurate results, it will eliminate a large number of unnecessary surgeries (potentially saving the U.S. health care system \$2 billion per year).

The Smart Probe should be in widespread use by 2003, and its creators hope eventually to adapt it for use in detecting prostate, lung, colon, cervical, and brain cancer as well as breast cancer.

REVIEW

Get The Picture

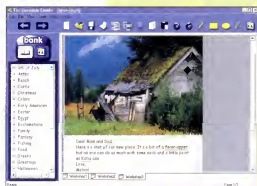
A Vermont software company called Tool Factory has a neat little application for digital shutterbugs looking for an easy way to attach their photos to e-mail messages. They call it The Incredible Mailer, and it lets you create personalized e-mail attachments including clip art, text, and/or your photographs with a few clicks.

When you launch TIE, it provides you with a standard menu bar, a browser-like toolbar, a big blank work area, and a "bank" of words and pictures that you can put there. There are 28 categories of words at your disposal, including Computer Words, State Capitals, Unusual Words, and commonly Misspelled Words. TIE offers 21 picture categories, including several holiday themes as well as People, Music, and Sport themes. The clipart images aren't the highest quality pictures we've seen, but TIE's ability to add any digital image stored on your computer more than makes up for this.

To find a picture to attach to your messages, click the Tools menu and click Add Picture. The standard Windows file dialog box that appears lets you find images anywhere on your hard drive. Click the image or file you want (or click the Open button), and TIE shunts them directly to your current document (called a Workshop). TIE lets you add text, draw on or near your picture, or move it around your Workshop with controls similar to those found in Paint. Click the Send Email button when you're done creating your masterpiece, and TIE automatically

launches your e-mail application and attaches a JPEG file containing your work to a message.

Installation is quick and painless, and the program's controls are easy to use with a little exploration. TIE costs \$59.95, but Tool Factory offers a 10% discount to online buyers.



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REVIEW

Biometrics Puts Bullies Out Of Business

Several middle schools and high schools in three Pennsylvania school districts are testing a new school lunch system equipped with biometric technology that eliminates the need for students to carry swipe cards or cash. Designed by Food Service Solutions of Altoona, Pa., the system works just like a regular cafeteria cash register, except for the fingerprint scanner mounted nearby. Students go through the line and get their food, the cashier rings up the items they've selected, and they place their fingers on the scanner to verify their identities. The system deducts appropriate funds from accounts that students' parents create in advance, and the school sends a letter home when accounts get low.

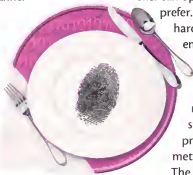
There are several benefits to using such a system. No lunch cards and no cash means nothing for students to lose or forget, and nothing for others to steal; parents don't need to worry that money earmarked for lunch is spent elsewhere. Additionally, students using their fingerprints to pay for lunch can avoid the stigma of using special cards or vouchers for free or reduced-rate meals in front of classmates (although other types of account systems may serve this purpose as well).

Food Service Solutions and the

schools involved were aware before launching the test program that privacy advocates and some parents would be concerned about the potential for misuse and other privacy issues. Because law enforcement uses fingerprints to identify criminals, using them in schools may have unpleasant connotations, but the program is voluntary, and parents can opt out if they prefer. The system hardware is flexible enough to allow for barcode or PIN (personal identification number) use for students that prefer those methods.

The technology may need some work before it's adopted permanently, according to Lower Merion School District Superintendent Dr. David Magill, but there haven't been any privacy complaints. "The program is voluntary, and we got the permission of every parent, so there haven't been any complaints at all," he says.

"In some cases it works okay and in some cases it doesn't," Magill says. Lower Merion may elect instead to adopt a PIN or swipe card system.



Extreme Mobility

PC makers build notebooks for traveling, but there are limits to their usefulness when outlets are few and far between. A new accessory called Travel Power from APC (American Power Conversion) extends your notebook's range and increases your productivity whether you're spending days in a car or hours in a plane to get where you're going.

Travel Power is a 75-watt DC/AC power inverter that will keep your notebook steaming along just about anywhere, thanks to plugs that fit into a car's cigarette lighter and an airplane's in-flight seat connector. It has a standard outlet (with a handy flip-down cover) on one end where your power cord plugs in and provides a steady flow of power to your notebook, protecting its delicate electronic components. It also ensures that you never use more power than your car battery can handle. If, for example, you're using your notebook in a car with Travel Power and the battery drops below 10.8 volts, a red warning light comes on and the unit cuts out so you don't drain your car battery.

In addition to keeping your notebook running, Travel Power also charges its battery, and you can use it to power your cell phone charger or other electronic devices. The unit is compact and weighs less than one pound, so in some cases it will take up less space in carrying cases than a notebook's own AC adaptor. It is the first DC/AC inverter to garner RCTA (Radio Technical Commission for Aeronautics) approval for use in the air, and it has FCC (Federal Communications Commission) and CSA (Canadian Standards Association) certification as well. Travel Power has an estimated retail price of \$79.99 and comes with a one-year limited warranty.



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Duly Quoted

"It's going to take time, and it's not effortless, but the move toward the so-called hydrogen economy has started. We've taken the baby steps."

—Steve Millett, Battelle hydrogen fuel cell researcher, on the rapidly expanding fuel cell industry. (ABC News)

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Everyone knows a man's La-Z-Boy is his real best friend, and now the popular recliner company has a chair for folks that like to stay connected while they recline. The Explorer e-cliner has fabric or leather upholstery and a drink holder and storage space built into the right arm. It also comes with extras like an integrated 120-volt electrical outlet with surge protection, a high-speed DSL (digital subscriber line) port, an analog phone line, and an AC adapter for a notebook PC (which you can rest on a swivel-out tray table stowed in the left arm). You even get a Sony WebTV Plus Internet receiver and two free months of service (starting at \$1,049 in fabric and \$1,299 in leather or vinyl; 734/242-1444; <http://www.la-z-boy.com>). ■

3.34 Megapixel resolution

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One-Hour Power

The proliferation of digital cameras and handheld electronic devices is great, but it makes keeping yourself in fresh batteries increasingly challenging. Rechargeable batteries are one solution, but waiting for them to charge can be vexing at best. As its name suggests, Rayovac's new 1-Hour Charger charges up to four AA or AAA nickel-cadmium or NiMH (nickel-metal hydride) batteries in an hour, or one 9-volt rechargeable in two or three hours. Its "smart charger" technology automatically senses the amount of juice left in each battery cell and charges them accordingly (\$29.99; 800/237-7000; 608/275-3340; <http://www.rayovac.com>). **II**



Rayovac's new 1-Hour Charger

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From Our Other Issues

Here are some of the top stories from *Smart Computing's Guide* and *Learning Series*. These issues are available on newsstands now, and the complete text is also available on our Web site at <http://www.smartcomputing.com>. Look for links to these issues on the home page's left side. Direct links to each article appear in the text below.

Learning Series:

PC Fixes

This issue will help you fix hardware and operating system problems. Learn how to troubleshoot your hard drive, speakers, microphone, monitor, printer, scanner, keyboard, DVD drive, and much more. Plus, tons of tips and tricks for dealing with frustrations in Windows 95, 98, and Me. To access the following articles online, type <http://www.smartcomputing.com/learning/pcfixes/> and add the bold word at the end of each news item. (Volume 7, Issue 3)



Most customer service representatives agree that you should collect certain information before you contact support personnel about your computer. You should know your PC's name, model number, and serial number. In addition, you should know the name of the manufacturer of your PC, the date you purchased your system, and what operating system you are running. See **support**.



Most of the problems between Windows Millennium Edition (WinMe) and other programs occur because the applications came out before the specifications for WinMe were available to the software manufacturers. Consequently, you are more likely to experience problems running older programs on WinMe than running newly released applications. See **compatibility**.



If your hard drive fails, use a service that specializes in recovering data, even from those drives that have endured the worst of fates. These services offer all kinds of help. For example, in addition to its standard recovery services, DriveSavers employs a professional "Data Crisis Counselor." This person is a professional psychologist who evaluates your situation, provides you with information on your available options,



and helps to alleviate your stress, which is common in a data loss situation. See **rescue**.

If your mouse suddenly won't work, ask yourself what hardware or software you recently installed. New hardware may be conflicting with the mouse or a rogue program may have overwritten the device driver for your mouse. See **mice**.

Guide Series:

PC Today

This issue covers notebook systems, shareware utilities, and Internet access tips. To access the following articles at our Web site, type <http://www.smartcomputing.com/guide/pctmar01/> and add the bold word at the end of each news item. (Volume 9, Issue 3)



The rules for notebook buying aren't that different from purchasing a desktop computer. It's always best to sample the goods first hand, extract every possible ounce of after-purchase support from the vendor, be exhaustive in your research of specifications, and meticulously compare the specs between your leading choices. See **notebooks**.



Although many users just want their computers to work with no

questions asked, checking up on your PC's health now and then can forestall bigger problems later. Luckily, there is a host of shareware and freeware programs available online to help you with this job. You can divide utility software into dozens of categories that are aimed at fixing or monitoring almost every aspect of your system. All can be useful, and all are represented in the trove of relatively cheap or free applications available for download. See **analysis**.



Many factors can affect how quickly you navigate the Internet, including processor speed, available RAM, the condition of your phone line, the distance of your location from the telephone company, your ISP's (Internet service provider's) equipment, Web traffic, and even a site's popularity. Despite these obstacles, you can take steps to get speedier connections. See **modems**.



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Light My Fire

We Test How Well Four CD-RW Drives Can Burn

YOU PROBABLY KNOW that CD-RW (CD-rewriteable) drives are good for archiving data, storing image files, and creating your own audio CDs. As an added bonus, CD-R (CD-recordable) and CD-RW media is really inexpensive. CD-RW drives continue to get faster than ever, yet they are still within the realm of most computer users' budgets. If you don't have a CD-RW drive, you're missing out. If you have an old CD-RW drive

that takes half an hour to burn (or record) your data, it's time to upgrade to a speedier drive. CD-RW drives come in internal and external configurations, so we included two of each in this review so you can see how they compare in performance and price.

How We Tested

We tested all of the CD-RW drives in this review on a 450MHz Pentium III system with 128MB of RAM, running Windows 98 Second Edition. We tested several features of each CD-RW drive using TCD Lab's CD Tach 98 version 2.00. We measured the drive's data transfer rate (how much data the drive can send to the PC's processor per second, measured in kilobytes per second), the drive rating (an interpretation of the drive's data transfer rate in which 150KBps equals a drive rating of 1X), the random-access time (the time it takes the



drive to find a random piece of information on a disc), and full-stroke access time (the time it takes the drive to move from the outermost track on a disc to the inner-most track). Finally, we measured how quickly the drives record 427MB of data to CD-RW media, and then we measured how long it takes to burn 427MB of data to a CD-R. All the drives we tested read the following optical drive standards: CD-DA (audio CD), CD-ROM, CD-R, CD-RW, Photo CD, and Video CD.

Hewlett-Packard 8230e

\$249

(800) 826-4111

(650) 857-1501

<http://www.hp.com>

If you want to buy an external CD-RW drive, there are several interfaces from which to choose, such as SCSI (Small Computer System Interface), USB (Universal Serial Bus), and IEEE 1394 (a high-speed bus, also known as FireWire, that is ideal for external drives because of its fast maximum data transfer rate, up to 400Mbps [megabits per second], and its Plug-and-Play ability). USB is probably the most convenient of the interfaces because most computers made during the past few years already

include a couple of USB ports.

So we decided to include an external USB CD-RW drive

in this review: the Hewlett-Packard CD-Writer 8230e.

The HP CD-Writer 8230e reads at 6X and writes and re-writes at 4X. The read, write, and rewrite speeds are another way of expressing the drive's data transfer rates. The 8230e's read and write speeds are considerably slower than the other drives we tested, but what you sacrifice in power you



BUYING TIPS

- 1 Do you need an internal CD-RW drive or an external one? If you work in a small office or if you have more than one computer at home, it may be wiser to buy an external drive. If the CD-RW drive is for your PC alone, an internal CD-RW drive is a better choice.
- 2 If you want a SCSI or IEEE 1394 CD-RW drive, and you don't have a SCSI or IEEE 1394 port on your computer, you'll have to add one. Obviously, this increases the cost of the drive, so keep that in mind when you're making your buying decision.
- 3 Buy good CD-R and CD-RW media. Inexpensive media is more inclined to have recording problems. The recording doesn't always "take" very well, which means you'll end up with a useless disc, and you'll have to start over.
- 4 Pay attention to what software comes with the drive you're thinking about buying. Any CD-RW drive you buy should include a couple of software programs, such as Adaptec's Easy CD Creator, and perhaps an audio utility with which you can record MP3 files.

make up for with a lower price and the convenience of a USB peripheral. Besides, we found the CD-R test results for this drive were actually pretty good, but more on that in a moment.

The HP CD-Writer 8230e has a 2MB buffer, which is common for most CD-RW drives these days. A CD-RW drive's buffer is a section of memory built into the drive. When data is recorded to CD, the information flows into the drive's buffer first and is recorded to CD in a smooth, steady stream. If the drive's buffer empties before the recording is finished, the data flow is interrupted, and the drive cannot record any more information to the disc. This error is called a buffer underrun and causes the disc to become unreadable. The drive is compatible with the Windows 95/98/2000/Me operating systems.

We connected the drive to our test PC and fired up our CD Tach benchmark. The HP CD-Writer 8230e's data transfer rate clocked in at 896KBps, which equals the drive's maximum drive rating of 6X. This drive may be slower than the rest in some respects, but it posted very good random-access and full-stroke access times. The drive's random-access time of 122ms (milliseconds) was second only to Sony's. The HP CD-Writer 8230e's full-stroke access time also was the second fastest at 228ms.

The HP CD-Writer 8230e stumbled a bit in our first recording test. It took this drive 15:40 to record 427MB of data to CD-RW, which is by far the slowest time. External drives tend to take a bit longer to record data, however, so we were not entirely surprised. The HP CD-Writer 8230e did much better in our CD-R test, in which it recorded 427MB of data to CD-R in only 7:38, considerably faster than our other external drive, the QPS Que! Fire drive.

If you need an external drive that burns CD-Rs quickly, the HP CD-Writer 8230e is a good choice. It's inexpensive for an external drive, and it records well to CD-R.



QPS Que! Fire

\$299

(714) 692-5573

<http://www.qps-inc.com>

QPS makes flashy drives that appeal to Macintosh and PC users alike. The Que! Fire CD-RW drive (model number QPCDRW8432FEMG3) we tested looks pretty, but this drive doesn't have as much power under the hood as we thought it should.

The Que! Fire CD-RW drive is an external IEEE 1394 drive that reads at 32X, writes at 8X, and rewrites at 4X. The drive's 2MB buffer is a typical buffer size for today's CD-RW drives. The Que! Fire CD-RW drive is compatible with Win98 and MacOS 8.5 (or higher).

This drive's strength is its fast read speed. We measured its data transfer rate at 3,667KBps, the fastest of all the drives we reviewed. The data transfer rate equals a drive rating of 21.4X, which is quite good for a 32X drive. The Que! Fire CD-RW drive's random-access and full-stroke access times were not as good, however. The random-access time was 147ms and the full-stroke access time was 297ms, but both times were the slowest among the drives we tested in this roundup.

The recording times posted by the Que! Fire CD-RW drive in the all-important recording tests were not bad for an external drive, but we saw better results from the other drives we reviewed. The Que! Fire CD-RW drive

recorded 427MB CD-RW media in 10:59. That's not terrible, but it was only good enough for third best in our review. The results from the CD-R burning test were so-so. The drive recorded the data in 8:20, which is acceptable but still not as nimble as the other drives we tested.

The Que! Fire drive isn't a terrible drive, but we're not going to give it a big thumbs up either. It has a good read speed but we expected faster recording. The Que! Fire CD-RW drive costs more than the other drives we reviewed, but the \$299 sticker price is a pretty reasonable price for an IEEE 1394 drive.

Sony Electronics CRX160E-A1

\$299

(800) 352-7669

(408) 432-1600

<http://www.storagebysony.com>

Like Yamaha, Sony manufactures a variety of products. Sony's CD-RW drives are consistently good, and we found the CRX160E-A1 to be one of the best CD-RW drives we've tested.

The CRX160E-A1 reads at 32X, writes at 12X, and rewrites at 8X. It is an internal ATAPI



(Advanced Technology Attachment Packet Interface) CD-RW drive that has a sizeable (although not as sizeable as Yamaha's) 4MB buffer. As with the Yamaha CRW2100EZ drive that we also tested, the larger buffer should cut down the number of buffer underruns you may experience when recording data. The Sony CRX160E-A1 is compatible with Windows 95/98/NT 4.0/2000.

The CRX160E-A1's read time was the third fastest (or second slowest, if you like) among the drives we tested. It has an average data transfer rate of 2,281KBps, which equals a drive rating of 15.1X. This is just less than half of the drive's maximum drive rating of 32X, which bothers us a little, but the rest of the drive's test scores make up for its slower read speed.

For example, the CRX160E-A1's random-access and full-stroke access times were the fastest among all the drives tested in this review. Its random-access time was a scant 106ms, and the full-stroke access time was 177ms, which is considerably faster than any of the other CD-RW drives we looked at.

The CRX160E-A1 made a good showing in our final round of tests, as well. It recorded 427MB of data to CD-RW media in only 7:06, which was by far the fastest time in this roundup. The CRX160E-A1 also sailed through our CD-R burn test, recording 427MB of data in only 4:34, second only to Yamaha's CRW2100EZ drive.

The CRX160E-A1 is an excellent drive. We really like it, but we believe the Yamaha's slightly superior CD-R recording ability gives the Yamaha drive the edge. Still, the CRX160E-A1 is a great choice.

Yamaha CRW2100EZ

\$260
(714) 522-9011
<http://www.yamaha.com>

Yamaha is known for making so many disparate products, we think it's just a matter of time before it creates the first motorcycle with a CD-RW drive in the console and a drum kit in the back. Maybe Yamaha still is trying to figure out the best way to affix the snare drum to the rear fender. One thing Yamaha won't have to worry about is how to make a good CD-RW drive. Yamaha didn't fool around

when it created the CRW2100EZ CD-RW drive. It has a fat 8MB buffer and can burn data in a hurry.

The CRW2100EZ is an internal ATAPI drive that writes at 16X, rewrites at 10X, and reads at 40X. On paper, this is the fastest CD-RW drive we've tested; it's the first one to boast a write speed of 16X and a read speed of 40X. The 8MB buffer we mentioned is four times larger than the buffers found in most CD-RW drives today. The extra room should drastically reduce the No.1 error users encounter when using CD-RW drives: buffer underruns.



This drive is compatible with Win9x/NT 4.0/Me/2000. It comes with a decent collection of extra software, including the popular Easy CD Creator software from Adaptec and the Neato CD labeling kit.

We were pretty impressed with the CRW2100EZ's test results. We measured its average data transfer rate at 2,720KBps, which is equal to a drive rating of 17.7X. This is a little less than half the drive's maximum drive rating, but it's still pretty good for a CD-RW drive. The CRW2100EZ's random-access and full-stroke access times were mixed. The random-access time was a fleet 122ms, second only to the Sony CD-RW drive we reviewed in this roundup. Its full-stroke access time of 275ms is a bit pokey, however.

The Yamaha drive performed relatively well in our final round of tests, although we would like to see a faster recording time to CD-RW. It recorded

427MB of data to a CD-RW in 9:56. This was the second fastest result in this particular test, but we prefer drives that can record this amount of data to CD-RW in 8 minutes or less. The Sony drive needed only 7 minutes to record the same amount of data to a CD-RW. But the CRW2100EZ really kicked it up a notch when recording to CD-R. It burned 427MB of data in only 3:22. Now *that's* fast! In fact, no other drive we tested in this roundup came close to this mark.

We wish the CRW2100EZ's read time and CD-RW recording speeds were a little bit faster, but at the end of the day we choose this drive for our Smart Choice award. The speedy CD-R burn time won us over. We like to record data in a hurry, and most people use CD-Rs rather than CD-RWs, mostly because you need to use CD-Rs when you're creating an audio CD. Furthermore, the price of the drive is very reasonable, and the big 8MB buffer lowers the likelihood of buffer underruns.

Final Word

Our Smart Choice was not easy to decide upon because we had two excellent candidates in Yamaha's CRW2100EZ and Sony's CRX160E-A1. The Sony drive performed well in most categories, but the disappointing read speed gave us pause. The Yamaha drive burns CD-Rs faster than anything we've ever seen, yet it needed 10 minutes in our CD-RW recording test, whereas the Sony drive only needed seven minutes. Ultimately, we decided that the Yamaha drive was the one for us because of its superior CD-R recording speed. We think it's better to burn fast than to fade away. ■

by Michael Sweet

System

Audio, Video & Speed Define Another Dimension

Dell's Dimension 4100 might look like any other beige desktop system, but this machine is anything but normal. The system's video abilities pack a considerable wallop considering the machine's reasonable price. Its overall expandability, performance, and components are also impressive. All told, there's not much we didn't like about the \$1,477 version of the Dimension 4100.

At the core of the machine we tested is an Intel Pentium III 866MHz processor built on the newer Intel 815E chipset, with a 133MHz bus and construction features geared toward graphical chores. The system is stocked with a good supply of 128MB of SDRAM (synchronous dynamic RAM), which is upgradeable to an even healthier 516MB via two DIMM (dual in-line memory module) slots. Although the 815E chipset has an integrated graphics accelerator, Dell ships the 4100 with an NVIDIA GeForce2 GTX 4X AGP (Accelerated Graphics Port) graphics accelerator with 32MB of DDR (double-data-rate) memory. That addition alone is noteworthy, especially when you get around to playing games and putting the I2X NEC DVD-ROM drive to use.

The included Western Digital 20GB Ultra ATA hard drive isn't the largest we've seen for a system in this price range, but it should provide plenty of appreciated storage room. You'll also appreciate the system's quality 17-inch Dell M781 monitor, three-piece Altec Lansing audio system (including subwoofer), Windows Me operating system, 56Kbps (kilobits per second) modem, and overall excellent expandability.

For expansion, the interior of the system's mid-tower chassis has three open PCI (Peripheral Component Interconnect) card slots, an AGP slot filled with the NVIDIA accelerator, three open 3.5-inch drive bays, and one open 5.25-inch drive bay. It's easy to reach the internal components thanks to the ample space Dell constructed the system with and the cover that slides right off the case. Our only complaint with the system's expansion capabilities is the lack of more than two USB (Universal Serial Bus) ports located at the back of the case.

That gripe is a minor one, especially after we saw what the Dimension 4100 could do when we put it to work. To test the machine's DVD-ROM and video abilities, we played the DVD movie "Armageddon" and

Dimension 4100

\$1,477
Dell
(800) 999-3355
(512) 3384400
<http://www.dell.com>



installed and played the 3-D games Quake III and Unreal. In addition, we played several audio CDs to get a feel for the system's audio system. The system did not let us down in a single facet.

Other than the monitor's display being slightly darker when we watched the DVD, we had no complaints with the Dimension 4100's ability. The DVD action flowed without skipping, and the images rendered on the monitor were also focused, sharp, and defined. Gaming was as impressive, with graphics popping off the screen and video flowing seamlessly. In addition, audio supported by the Creative Sound Blaster Live! Value soundcard was superb, with the subwoofer filling out the deeper tones very well. Overall, Dell forks over a great deal of home-entertainment performance for less than \$1,500.

Just as gratifying was the system's performance in our benchmark tests. We ran BAPCo's SYSmark2000, which is a suite of 12 application workloads divided into two categories: Office Productivity and Internet Content Creation. We also used MadOnion.com's Video2000 and 3DMark2000 tests. Video2000 measures a system's video ability by assigning scores based in part on the processor, graphics card, memory, and motherboard. 3DMark2000 evaluates a system's 3-D capabilities by using various tests for polygon counts, bump mapping, texture rendering speed, and image quality.

The Dimension 4100 easily outdistanced several systems we've seen using a 1GHz PIII processor in all three of our benchmark tests. Its overall SYSmark2000 score of 136 is the best we've seen to date from a machine at this speed using WinMe. In addition, its 2,496 Video2000 and 6,555 3DMark2000 scores are the best we've seen from such a system.

Dell packs the Dimension 4100 with Microsoft WorksSuite 2001 and Money software. In addition, Norton AntiVirus 2000 and an assortment of games were loaded on our test unit. Other than the possible inclusion of a CD-RW drive to burn CDs, we can't think of much Dell could have included with the 4100 to improve on the system without upping the price. ■

by Blaine Flannig

Laser Printer

A Speedy Little Laser

Xerox's DocuPrint P1210 is a fine black and white laser printer that's priced just right for a home office or small office. The DocuPrint P1210 has a 66MHz processor and comes with 4MB of memory, expandable to 68MB, maximum. The printer has a standard parallel port, but you can connect to it through a USB port. 10BaseT is optional if you want network connectivity. This printer has two paper trays: a 250-sheet standard tray and a 100-sheet multipurpose tray.

The DocuPrint P1210 is fairly small for a laser printer, but it isn't a lightweight in terms of speed, especially considering its low price. The DocuPrint P1210 can print a maximum of 12ppm (pages per minute) and has a maximum resolution of 1,200dpi. The DocuPrint P1210 also has PCL 6 and 5e emulation. PostScript Level 3 is available as an option. You can use this printer with several popular operating systems, including Windows 95/98/2000/NT 4.0 and RedHat Linux 6.0 or higher.

The DocuPrint P1210 performed well in our tests. We printed a 10-page text document, and the DocuPrint P1210 kicked out the first page in only 15 seconds. The printer finished printing the entire document in 58 seconds, a good, speedy time.

The DocuPrint P1210 then tackled our Photoshop

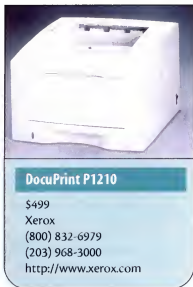
test. We couldn't print our test image at the printer's highest resolution so we lowered it to 600dpi. Because we dropped the resolution, the printer kicked the image out in only 49 seconds, which is really good. However, the image was too dark, not very sharp, and showed significant banding, all of which are bad.

For our final test, we printed out a three-page PowerPoint presentation, and the DocuPrint P1210 did a good job. The first page came out in only 15 seconds, and the entire

document finished in only 24 seconds. The charts in the presentation were sharp with nice dark lines.

If you want a low-cost printer for a home office or you need a printer for a small office and can live without lots of networking options, check out the Xerox DocuPrint P1210. It's priced right, and it's a good laser printer for text and charts. ■

by Michael Sweet



DocuPrint P1210

\$499

Xerox

(800) 832-6979

(203) 968-3000

<http://www.xerox.com>

Digital Cameras

Pretty Pricey Pictures

Our biggest problem with Epson's PhotoPC 3000Z is its price. At \$875, the camera won't endear itself to many entry-level and intermediate users.

That range of resolutions is impressive for a consumer model, but the shots the camera produced for us were just better than average compared to other 3-megapixel cameras we've seen that cost as much as \$100 less than the 3000Z.

Beyond image quality, the 3000Z records 10 seconds of audio with each shot and can shoot up to 25 seconds of video at 15fps

(frames per second) at 320 x 240 pixels. It has macro, continuous, interval, and panorama shooting modes. In addition, there's a hot shoe for the built-in flash; auto and manual shutter speed settings; three ISO settings (100, 200, and 400); USB (Universal Serial Bus) and serial connections; auto, fixed, and custom white balance settings with spot and matrix metering; auto and manual aperture settings; adjustable, auto, and macro focus ranges; a built-in speaker and microphone; and sports, landscape, and portrait exposure modes. Epson makes accessing the features fairly easy, and the menus are as intuitive as you're likely to find in a high-end camera.

At the front of the attractive silver and blue camera is a threaded (for 49mm lenses and filters) 7mm to 21mm lens (equivalent to a 34mm to 102mm lens on a 35mm camera) with 3X optical and 2X digital zoom. Overall, the 3000Z's shape is compact but bulky, with an oversized handgrip for the right hand that gives it a comfortable feel. However, you'll need the included neck strap, and you have to adjust to the placement of the flash at the middle front directly next to the shutter button.

The camera runs on AA NiMH (nickel-metal hydride) rechargeable batteries (charger included) and ships with a 16MB CompactFlash memory card that stores one to 155 shots. Sierra Image

Expert software and excellent overall documentation provide excellent finishing. ■

by Blaine Flamig



PhotoPC 3000Z

\$875

Epson

(800) 463-7766

(310) 782-0770

<http://www.epson.com>



FLOWCHART SOFTWARE HELPS

STREAMLINE the drawing process and makes creating flowcharts, timelines, diagrams, floor plans, and other illustrations for your small business a snap. Unlike other graphics programs, such as Macromedia FreeHand or Adobe Photoshop, flowchart software is specifically for diagramming. Many programs have special commands that let you align and evenly space your charts' objects for a streamlined, professional look.

Although some applications, such as Micrografx' iGrafx FlowCharter 2000 Professional and Microsoft's Visio 2000 software, cost hundreds of dollars, there are inexpensive alternatives that have the features and options to quickly and easily create business-related charts and diagrams.

To help find a flowchart program for your budget, we searched the Web for popular applications for less than \$100 with the flexibility, power, and features that many small-business users need. We looked for software that offers trial downloads so you can check the product before buying it. After testing, we awarded our Smart Choice, the overall best program in our roundup.

How We Tested

Using a 56Kbps (kilobits per second) modem, we downloaded four flowchart programs from the manufacturers' Web sites. The applications were all less than 3MB and downloaded in minutes onto an IBM PC with a 450MHz Pentium II chip and 128MB of RAM, running Windows 98 Second Edition.

After installing each application, we examined its ease of use; the number of charts, diagrams, and other illustration templates available; as well as the program's tools and options for achieving quick, professional results. We also considered the application's price compared to other programs in the roundup and the amount of helpful information, tips, and advice available to users.

Let Your Thoughts Flow

Chart Your Strategies Graphically With Flowchart Programs

Flow Charting PDQ Lite 1.1j

\$89

Patton & Patton
Software
(800) 525-0082
(520) 888-6500
<http://www.patton-patton.com>

Patton & Patton
Software Corporation

A clean, uncluttered interface combined with some handy drawing and editing tools make Flow Charting

PDQ Lite one of the simplest flowchart programs in this roundup and a good choice for creating simple designs that don't require a lot of editing or template options. Budget-conscious buyers beware; the program is also the most expensive in this roundup.

It should take only a few seconds to familiarize yourself with PDQ Lite's main window. Menu buttons, such as New Document, Print, Save, Zoom, and Help, appear across the top of the application's main page. Five toolbar buttons along the left side of the drawing area let you choose from among the selector tool or the text, shape, line, and template creating and editing options. Dialog boxes containing basic

BUYING TIPS

- 1 Be sure to download from the Web only flowchart software that comes with a trial period. This way, you can try the program before buying it and find out first-hand whether the application meets your needs.
- 2 Look for a program that will grow with your changing diagramming needs. A flowchart application with a few templates containing rudimentary shapes and lines may not work well for illustrating building layouts, maps, or project time lines.
- 3 Programs with alignment, color-schemes, and other automatic formatting features save you time and quickly give your programs a clean, professional appearance.

shapes and lines for each of the eight available flowchart and diagram templates also appear in the main window; highlight one of these objects and drag and drop it into the drawing area to add the item to your illustration.

For new users, PDQ Lite has a Jump Start tutorial outlining the program's features, as well as a comprehensive Help menu. There are also several easy-to-use, timesaving features that let you quickly build and edit your flowchart. The program's QuickConnect option, for example, lets you copy objects you've placed on the drawing area and add connecting lines with one click. Position your cursor over the center of a shape, right-click, and drag and drop the object in another part of the drawing area to create a copy of the shape with a new connector line leading back to the original object.

PDQ Lite lets you anchor lines, which increase or decrease in length and change direction as you edit an anchored shape. The hyperlink option lets you link a shape or line to objects in the diagram or in different diagrams. Users simply click a shape or line and press F6 on the keyboard to be immediately routed to the linked object.

With its timesaving features and extremely clean, simple interface, we can't help but like Flow Charting PDQ Lite 1.1j. You can download the fully functional 2.5MB program free for a 15-day trial. However, the program's high price and its limited template options compared to other applications in this review prevent us from designating PDQ Lite as our Smart Choice. Unless a simple, easy-to-navigate interface is most important to you, keep reading.

Paraben's Flow Charter 3.0d

\$35
Paraben
(801) 319-6346
<http://www.paraben.com>



Flow Charter 3.0d doesn't have the simple, easy-to-use interface that we liked in Flow Charting PDQ Lite, and it doesn't offer the flexibility and features of other flowchart software in our roundup. However, the program has lots of template objects to choose from, timesaving shape-editing options, backup features, and a low cost that should please most budget-minded users who may not need or want a more powerful and costly application.

With its numerous toolbars across the top of the main window and its drop-down text and shape menus and template objects along the side of the drawing area, Flow Charter's interface may take some getting used to. New users can take the program's Quick Start Tutorial for a walk-through of the application's features or check out the ample Help guide for assistance navigating and using the program.

This program has only eight templates to choose from, including shapes for general-purpose flowcharts with various color schemes and large or small shape sizes. Unlike PDQ Lite, Flow Charter's templates include lots of drawings, symbols, and other objects, such as buildings, people, electrical outlets, stars, and keys, that you can add to spruce up your illustration.

One of Flow Charter's coolest features is the ability to edit types of shapes and lines, instead of all future objects or only one drawn item. Not found in the other programs we reviewed, this editing option lets you designate specific attributes, such as line thickness or fill and border colors for all squares, all circles, or all dashed lines, for example, saving you the time of having to reset formatting attributes for other objects.

Other Flow Charter features include an Autosave option and automatic backup to ensure that you won't lose hours of work if the

power suddenly goes off or your computer crashes. The Center On Page option lets you easily select shapes to center horizontally, vertically, or both on a page, and an Auto-Label option lets you add true/false or yes/no indicators to diamond shapes that serve as branches in your flowchart.

These handy backup options and easy shape-editing features, not to mention the tons of icons and symbols make Paraben's Flow Charter 3.0d a solid choice for business users. At \$35, the 1.2MB program is also the least expensive flowchart application in our roundup, and you can download a free trial version for 30 days. However, its complicated interface significantly cost Flow Charter in this roundup and put it out of reach of our Smart Choice award.

RFFlow 4.06

\$54
RFF Electronics
(970) 663-5767
<http://www.rff.com>

RFFlow 4.06 from RFF Electronics has an even more complicated interface than Paraben's Flow Charter, but the program also has loads of templates containing more than 1,000 symbols, shapes, and objects for a variety of charts, diagrams, and other illustrations, as well as a few object-spacing and alignment options for creating neat, professional-looking flowcharts.

Getting used to the RFFlow way of accessing commands may feel a bit awkward at first. You access most of the program's commands by clicking the correct button on the toolbars above the drawing area. To move, copy, resize, or edit a shape in RFFlow, for example, you must first click the Select button, click the appropriate object on your drawing area, and then click a chosen editing button to access that tool.

If you need help navigating the interface, RFFlow provides lots of helpful information and tips as you draw. There are also several editing and formatting features that can save you lots of time.

Of these, RFlow's spacing and alignment tools impressed us most. Using the Spacing Shapes tool, for example, you can easily and quickly give your flowchart an evenly spaced, professional appearance. Unlike Flow Charter's Center On Page feature, the RFlow Spacing Shapes option lets you control the horizontal and vertical space between multiple shapes anywhere on the page. Select the shapes you want to space and click the Spacing Shapes option on the toolbar. Choose whether to space horizontally or vertically, enter the distance that you want between your shapes, and click OK.

After selecting your shapes, you can also choose the toolbar's Align Shapes option to align objects to the left, center, right, top, middle, or bottom of the first shape you selected. Other options include an Auto Connect tool, which automatically inserts lines between any two selected shapes and a spell checker that ensures your flowchart text is spelled correctly.

Despite its somewhat unfriendly interface, RFlow 4.06 impressed us with its numerous flowcharting options, alignment and spacing features, and reasonable \$54 price tag. The 1.75MB file you can download for a 30-day free trial is only partially functional, which is another drawback. If you're looking for versatility and flowchart choices combined with a more intuitive, easy-to-use interface at an even better price, read on.

SmartDraw 5.11 Standard

\$49

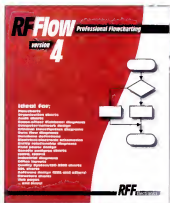
SmartDraw.com

(800) 501-0314

(858) 549-0314

<http://www.smartdraw.com>

A powerful, yet simple program with more than 1,000 shapes, drawings, and



symbols, as well as some handy formatting and editing features, SmartDraw 5.11 lets even the most art-challenged user create professional-looking floor plans, timelines, diagrams, charts, and much more.

The program's interface is straightforward and easy to figure out.

You can find any of the template objects in the SmartDraw Explorer window to the left of the drawing area. This directory organizes the templates and objects in an easy-to-navigate tree structure that is familiar to anyone who has ever used Windows Explorer; search options let you find a particular item based on keyword or subject. Above the drawing area, SmartDraw displays the specific template's shapes and lines as toolbar buttons; click and drag the object to your drawing area and add it to your illustration.

Altering the attributes of your drawing objects in SmartDraw is also simple. Right-click a shape for a pop-up menu of editing options, such as Fill Color, Shading, and Rotate. If you need help, SmartDraw provides tips and hints as you create and edit, as well as a 12-step tutorial that walks you through SmartDraw's features and options.

Other format options let you insert preformatted tables into your drawings, add 3-D color and

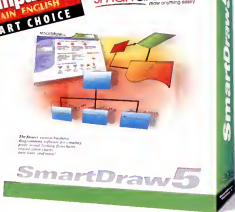
shading effects to your flowchart objects, and link shapes in one drawing to another drawing. You can even measure straight lines and insert those dimensions, which are scaled to your current ruler settings, into your illustration or attach text to a straight line. In addition, Web-page designers can create optional transparent backgrounds for JPEG (Joint Photographic Experts Group) and GIF (Graphics Interchange Format) images and working hyperlinks for flowcharts.

We also liked SmartDraw's numerous aligning and spacing options. The Automatic Connectors feature, for example, creates a flowchart line layout for you; you simply drag and drop the shape to the layout, and the program automatically aligns it to fit the flowchart design. An Align option under the program's Arrange menu lets you align the edges of your flowchart shapes, and a Make Same Size feature makes all your shapes the same height, width, or both. You can also use the Space Evenly feature to place your drawings' lines and shapes an equal distance apart.

With its reasonable \$49 price tag, versatility, numerous tools, and user-friendly setup, SmartDraw 5.11 ranks high in our roundup—so far it earned our Smart Choice award. If you want to create flowcharts and diagrams, this is one program you'll definitely want to check out. And if you want to try the 2.94MB program before you buy, you can download a fully functional version for 30 days, free.



www.smartdraw.com



Go With The Flow

Although each program has its own strengths and advantages, we can give only one Smart Choice award, and that honor goes to SmartDraw 5.11. With its powerful combination of timesaving features, flowchart choices, and price, not to mention its user-friendly interface, SmartDraw 5.11 easily ranks ahead of the competition. It's a must-see for any would-be diagramming illustrator. ■

by Lori Robison

General Reference

What Do You Want To Learn Today?

We associate many things with the end of one year and the beginning of another: Christmas, New Year's resolutions, the Super Bowl, and the release of Microsoft's latest version of the Encarta Encyclopedia. This year, we resolved to review not only the encyclopedia, but the entire Encarta Reference Suite 2001.

Encarta Reference Suite 2001

\$74.95 (CD-ROM or DVD)

Microsoft

(800) 426-9400

(425) 882-8080

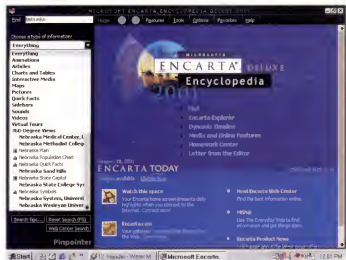
<http://www.microsoft.com>

The Encarta Reference Suite 2001 consists of four programs: The Encarta Encyclopedia Deluxe 2001, the Encarta Africana Third Edition, the Interactive World Atlas 2001, and the Encarta World English Dictionary 2001.

The Reference Suite is available in a CD-ROM or DVD-ROM format. The CD-ROM version contains seven discs—two each for the encyclopedia and Encarta Africana and one each for the dictionary and atlas, plus one installation disc. If you use the CD-ROM version of the encyclopedia or Africana, you'll frequently have to change discs to access some of the material. This is unavoidable because the sheer amount of information in both the encyclopedia and Africana simply cannot fit onto one CD-ROM. Given the choice, we'd rather change discs and have the extra material than cut back on the extra elements that make these programs so interesting and fun to use.

The DVD-ROM version packs all of the programs into one disc, which is much more convenient than the CD-ROM version. We prefer the DVD-ROM version because you can access all the programs in the Reference Suite without having to change discs. This is exactly the sort of thing DVD was designed for, so if you have a DVD drive, we strongly urge you to get the DVD-ROM version of this software.

The 2001 version of the Encarta Encyclopedia is flush with resources, just as previous versions we've reviewed. The user interface is intuitive and includes many options for searching materials. For example, you can quickly search for video, sound, or other multimedia elements related to a specific topic; you can choose to search only for articles appropriate to the subject you're interested in; or you can choose to search for everything related to a subject, from charts to maps to animations, pictures,



and virtual tours. One feature of the encyclopedia we especially like is the ability to look up the definition of nearly any word in an article simply by double-clicking it. The definition of the word will pop up nearly instantaneously. This feature should be especially helpful for younger users, and we think it's a nice touch.

The other materials in the Encarta Reference Suite 2001 are equally easy to use. Encarta Africana Third Edition shares an almost identical interface to the encyclopedia. Like the encyclopedia, Africana does not want for interesting multimedia enhancements and well-written articles on a dizzying number of topics. Africana is an interesting piece of work, covering everything from early African history to slavery to early American Blues music to Martin Luther King Jr.'s famous "I Have a Dream" speech delivered at the Lincoln Memorial in Washington, D.C. in 1963.

The Interactive World Atlas 2001 and Encarta World English Dictionary 2001 are not quite as flashy as the encyclopedia or Africana, but they are more interesting to explore than their titles would imply. You can use the Atlas to easily find information about nearly every part of the world, thanks to an interactive globe that you can spin around with your cursor. The program includes several tools for zooming into and out of the globe and for bookmarking interesting sites. It's far more than just a map. And the dictionary, as it turns out, is far more than just a dictionary. It includes a thesaurus, quotations, and a style guide for grammar-challenged writers.

We really like the Encarta Reference Suite 2001. There are no superficial programs here, no extras that are merely thrown in as an afterthought. Each program is well crafted and engaging. The sheer amount of multimedia features in this collection makes traditional leather-bound encyclopedias seem truly antiquated. This is one of the most useful programs you can put on your PC, especially if you have kids in the house. ■

by Michael Sweet

Graphics

Photo Lover's Paradise

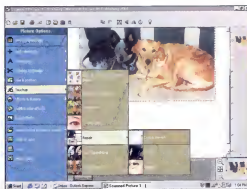
Microsoft's Picture It! has long been recommended among photo programs. In today's world of scanners, digital cameras, and photo-quality inkjets, it's even more so. Mix in the popularity of family photo pages on the World Wide Web, and Picture It! Publishing 2001 Platinum is almost a required purchase.

Rather than list what Picture It! Publishing 2001 can do with your photos, it's faster to ask you what you want it to do. Want to touch up red eyes, wrinkles, and scratches on a print? Done. Want to assemble a bordered photo montage of a client's products and put it on the Web? Okay. How about weird stuff, such as bulging out your dog's eyes, putting your husband's head inside a spacesuit, or printing trading cards with your kids' faces? No problem. Picture It! Publishing 2001 can even make animated musical e-mail messages, newsletters, greeting cards, brochures, business cards, album pages, and tons more.

Everything in Picture It! seems friendly and familiar. Its main interface looks and acts like a well-made Web page. Its menus follow the same design as the Windows 95/98 Desktop, and there are tutorial movies available to spark your creativity. Also, nearly every retouching option has a color illustration to show you what it will do to your image. Of course, it's all reversible.

Picture It! Publishing 2001 does have drawbacks. Our chief gripe is that this program is *huge*. You can choose not to install every part of it, but count on it taking up more than 1GB of hard drive space. We chose not to install all 200,000+ images from the seven Picture It! CD-ROMs, but our installation still took more than

90 minutes from a 10X DVD drive. It's also a memory hog. With 128MB of RAM, we still couldn't run much else if we had three photos open at once.



Picture It! Publishing 2001 Platinum

\$54.95

Microsoft

(800) 426-9400

(425) 882-8080

http://www.microsoft.com

All in all, Picture It! Publishing 2001 Platinum is a pretty incredible package. Its free, online add-on packs are icing on the cake. **II**

by Marty Sems

Security

Complex Setup, Good Protection

Personal firewall software sometimes has a complex interface making it difficult to configure, especially for someone who's never used a firewall. Sygate's Personal Firewall 2.1 is a perfect example.

Users can choose security levels: Ultra (blocks all traffic), High, Medium, and Low or turn it Off. When an application requests Internet access, the firewall prompts you to choose whether the application should be allowed to access the Internet. Choose either yes or no to place the application in the Trusted Applications list or the Disallowed Applications list. When prompting the user, the firewall uses the name of the EXE file, not the name of the application. This may be confusing for inexperienced users who may not recognize

Sygate Personal Firewall 2.1

Free for personal use

Sygate

(510) 742-2600

http://www.sygate.com

Outlook Express as Msimn.exe.

You can move applications from the Trusted list to the Disallowed list in the Config window. Although there's a lot of flexibility, it's hidden under a confusing user interface. Some available options include allowing all traffic over a specified port (a virtual port

that connects your machine to a remote machine over the Internet) or IP (Internet Protocol) address. You can enable Network Neighborhood with a single click, although doing so opens a major hole in your firewall.

The software scored high in both of our tests. We set the firewall to High and ran it through its paces at ShieldsUp! (<http://www.grc.com>) and DSL Reports (<http://www.dslreports.com>). These sites scan for common vulnerabilities, but found no holes.

Overall, the software is effective, but it's confusing and difficult to set up. It's free for personal use or \$29.95 for business use (\$35.95 for a year of free upgrades). The software runs on Windows 95/98/Me/NT/2000, although it doesn't support Internet Connection Sharing found in Win98 Second Edition and WinMe. **II**

by Chad Denton

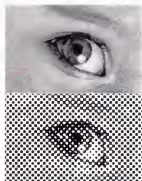


Congratulations!



The Olympus P-400 Dye-Sublimation Photo Printer has arrived!

The Olympus P-400 uses **dye-sublimation technology** to produce **true continuous-tone images**, just like traditional photographs. Inkjet printers, on the other hand, can only create the *illusion* of con-



tinuous tones by using a matrix of dots. That's why **even the best inkjet printer is no**

match for the P-400 when it comes to image detail and color vibrancy.

Unlike typical inkjet printers, the P-400 delivers **fade-resistant images with archival qualities** comparable to traditional photographs. And while inkjet printers will test your patience, the P-400 **can output an 8" x 10" print¹ in about 90 seconds²**

It's a 26-pound Digital Darkroom.



Olympus P-400 Dye-Sublimation Photo Printer

CAMEDIA
Digitally Inspired

You won't find a more **versatile**, more **convenient** printer than the Olympus P-400. Its **parallel and USB interfaces** let you print from your favorite PC or Mac photoediting application.

Even without a computer, you can **print images directly from your digital camera's removable media**—including SmartMedia,[™] Type I and II CompactFlash,[®] and Memory Stick[®]—thanks to the P-400's built-in SmartMedia and PC Card slots. Print on the spot, choosing from **numerous built-in print functions**—such as sepia-tone or black-and-white conversion, crop and enlarge, borders and vignettes.

Finally, you should know the Olympus P-400 can be yours for **under \$1,000³**—about one-fifth the cost of competitive dye-sublimation printers of comparable output size. You can learn more at **P400.olympus.com**.

Travel Through Time With System Restore

Roll Back Your PC's Settings

Installing new software is always a little dangerous. It takes just one maverick application to turn a finely tuned Windows Me installation into a crash-prone mess, and usually uninstalling the application isn't enough to repair the damage. The application leaves remnants of itself behind, along with any system changes it made, and those things frequently cause the most trouble.

In the past, putting a system back in working order usually required reinstalling Windows, but WinMe users can rely on the useful new System Restore utility. When enabled, System Restore tracks changes on your computer and creates a regular series of restore points. It's possible to establish restore points manually. Regardless of how they are created, the results are the same. All of the current hardware and software settings, installed file information, and other important system data are compressed and stored so they can be reinstated if things go wrong. When you change the system by installing programs, you can undo the new settings by rolling back, or reverting, to the old save point.

One of the nice things about System Restore is that it doesn't monitor or restore any of your personal files, within limits. It doesn't mess with user-created files with extensions, such as DOC, TXT, XLS, or BMP, regardless of where they are located on your PC. The entire contents of the MY DOCUMENTS folder are left untouched during a System Restore operation, even if you've created files with programs that were installed after

the restore point. You'll have to reinstall the program that created the files to open and edit them, but the files will be intact. System Restore also ignores your e-mail folders, graphics files, and WinMe's Favorites and History lists.

There are plenty of safeguards built into the System Restore utility that keep it from causing more problems than it is trying to solve. Unless you are using Safe Mode to access Windows, System Restore will create a restore point before rolling back to a prior date. That way, if things go wrong, you can put the system back like it was and try again.

The utility stores all System Restore points and other data it needs to operate in a hidden folder called _RESTORE, which is located on the drive where Windows is installed, usually your C: drive. You don't need to dig around in that folder unless you want to create a backup, but you may find it helpful to see how much hard drive space the folder takes up. It can sometimes account for several gigabytes of space that seem to be missing for no reason. Double-click My Computer and then the root directory where Windows is installed (usually C:). Click Folder Options from the

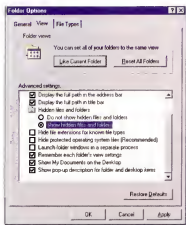
View menu. Select the View tab, scroll through the Advanced Settings options, and make sure the Show Hidden Files And Folders setting is selected and the Hide Protected Operating System Files box is not checked. Click Apply and you'll see the _RESTORE folder.

Create Your Own Restore Points

Windows automatically creates restore points every 10 hours your computer is running, but only after there is nothing going on for at least two minutes. If you are typing, playing a game, moving the mouse, scanning for viruses, or performing any other system activity, System Restore will not kick in until later. The system creates restore points once every 24 hours, regardless of how much you've been using your computer, but the system has to be idle for two full minutes or it will not create the restore point. These automatic restore points usually keep you covered in an emergency, but it's important to create your own restore points manually anytime you are about to install software or make other changes.

The process is simple: Click the Start button, choose Programs, Accessories, and System Tools and click System Restore. Choose the Create A Restore Point radio button and click

Next. Type a description, and the time and date are appended automatically. We typically type the name of the program we are installing. Click Next and wait until the Confirm New Restore Point window appears, then click OK to confirm it.



This is what your folder option settings should look like if you want to see the hidden _RESTORE folder.

point, all is not lost; there are other circumstances in which the restore points are created automatically. Most programs use an installation utility called InstallShield, and programs that use version 6.1 or later create their own restore points before the installation begins. Files that you installed through Windows Update create their own restore points.

Recovering With A Restore Point

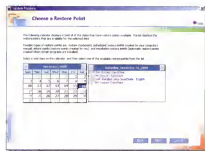
It's incredibly easy to use restore points. Save your work, close open programs, and open the System Restore Wizard. This time select the Restore My Computer To An Earlier Time radio button and click Next. You'll see a calendar with some of the dates in bold. Bold numbers indicate that one or more restore points exist for that date, and you can click the date to view them in the right-hand pane. You'll see entries labeled as System CheckPoints; these are the automatic restore points WinMe creates throughout the day. The restore points you created will be listed among the others on the date and at the time they were made. You can scroll back and forth through the months by clicking the arrow keys at the top of the calendar.

When you find the restore point you were looking for, click it to highlight it and click the Next button. Follow the prompts and wait until the system restoration is complete. You can boot to Windows in Safe Mode and access your restore points, but System Restore does not automatically create a new restore point if you do.

It's rare, but you may get an error message after the restoration saying Undo Was Unsuccessful. This message means System Restore left the system in the condition it was in when the restoration began. You must either choose an alternative restore point or free up some hard drive space to complete the process properly. The error message tells you how to proceed.

Advanced Settings

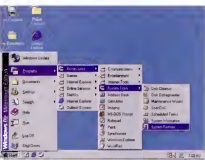
Microsoft so streamlines the System Restore utility's interface that at first it looks like a simple two-step operation. There are, however, many options hidden under that simple façade that



Bold entries on the Restore Point calendar represent days that contain restore points you can roll back to.

will give you complete control over your system restorations.

It's easy to give the utility more or less hard drive space to store restore points. The default setting uses up to 12% of your hard drive's total space, but with today's larger hard drives, that can be excessive. If the drive or partition you have Windows installed on is larger than 10GB, consider bumping System Restore's reserves to 1GB if you need the room. If you specify less space



These are the start menu folders you need to expand to access the System Restore utility.

than your restore points are currently using, the system deletes some of your oldest restore points to conform to your setting.

To change the setting, right-click My Computer and click Properties, then the Performance Tab. Click the File

System button and move the System Restore Disk Space Use slider to the left until it reads somewhere around 1,024MB and click Apply. Just remember the system erases old restore points to make room for new ones, and the more space you allocate, the further "back in time" you can go.

Always try to keep at least 1GB of free space on your hard drive. System Restore suspends its automatic updates once it detects less than 200MB of free drive space, and Windows virtual memory can eat up 500MB or more. Keep a nice-sized chunk of space free to make things run more smoothly.

Finally, make sure copies of all your important files are in the MY DOCUMENTS folder. This is especially important for files with an .EXE extension, such as program patches, that you don't want to lose.

Drawbacks

System Restore is a useful new addition to the Windows operating system, but it has numerous shortcomings that you'll need to work around if you want to use it properly. For one thing, it isn't an uninstaller. You can install software and then use System Restore to return your major system files to the condition they were in before the software was installed, but the software is still there (even though it won't run). To completely get rid of it you have to use the Add/Remove software utility (click the Start button, choose Settings, click Control Panel, and double-click Add/Remove Programs).

The System Restore utility doesn't allow for selective rollbacks. If you install a program that ends up causing trouble and then install several programs that work properly, when you roll back to a point before the first program was installed, all subsequently installed programs will be affected. Always consider running System Restore at the first sign of trouble after installing an application or you may regret it later. ■

by Tracy Baker

Traveling Light

Highly Portable Data Storage Options For A Mobile World

BULKINESS IS THE KISS OF DEATH FOR A PORTABLE DEVICE. If you've ever shopped for a digital camera, PDA (personal digital assistant), or MP3 personal music player, chances are you ignored the bigger devices in favor of smaller, cooler ones.

It's all well and good for manufacturers to make hip, miniature gadgets, but those gadgets need to store data

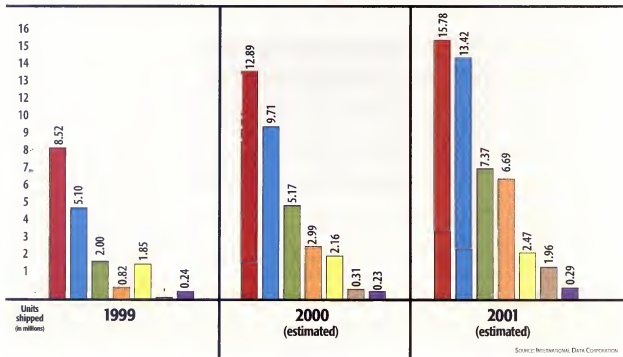
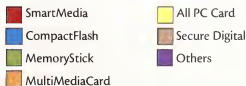
somewhere. Of course, they're too small to use most hard drives, CD-Rs (CD-recordable) and CD-RWs (CD-rewritable) drives, or Zip disks.

Some portable devices have built-in storage that you can't remove. You usually have to connect these to your computer with a cable in order to transfer data. Other gadgets can accept removable storage devices



Worldwide Memory Card Shipments

It may surprise some observers to find that SmartMedia, not CompactFlash, is the dominant memory card according to a survey of manufacturers. However, IDC predicts CompactFlash will narrow the gap with higher capacities, especially as multi-megapixel digital cameras catch on.



SOURCE: INTERNATIONAL DATA CORPORATION

such as solid-state memory cards, which store rewriteable data in silicon chips. These are almost always non-volatile, meaning they retain their data even when not connected to a power supply.

Removable memory cards are handy because it's easy to carry several of them, and you can use them to copy photos or files from one device to another, such as a reader peripheral connected to your PC or a photo inkjet printer such as Kodak's Personal Picture Maker 200 (\$200).

Go, Flash, Go

Most solid-state memory cards utilize flash memory, which can quickly write data in blocks rather than byte by byte. In fact, the terms "flash" and "solid-state" are often used interchangeably regarding memory cards.

Solid-state memory cards are fast; some formats can write half a megabyte per second or more and read even more swiftly. Memory cards are also rugged because they have no moving parts. Unfortunately, flash memory is expensive, costing much more per megabyte than magnetic disks, tape, or optical media.

Most memory cards have a feature that keeps you from inserting them the wrong way into a socket, such as SmartMedia's notched corner or CompactFlash's differently sized side slots. However, there may be nothing keeping you from inserting a card with a different voltage rating than your portable device uses, such as 3-, 3.3-, or 5-volt. Many memory cards can handle a range of voltage, but be sure to buy cards that are compatible with your device.

SmartMedia. We'll start our list of solid-state memory cards with SmartMedia, which is 0.03 inches thick x 1.46 inches wide x 1.77 inches long. According to IDC, it's the most popular format.

"In 1999, what really fueled SmartMedia was the popularity of digital cameras...and portable MP3

players," says director of IDC's semiconductor research Xavier Pucel. He credits Olympus and FujiFilm cameras for this, as well as MP3 players such as the Diamond Rio, Creative Labs' Nomad, and Samsung's Yopp.

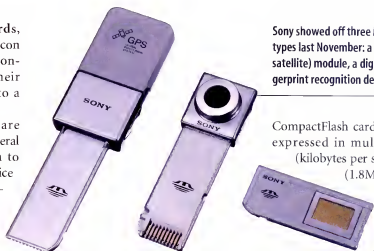
SmartMedia cards cost about \$30 for 8MB, \$60 for 16MB, \$100 for 32MB, and \$200 for 64MB (128MB cards may be available when you read this). That's about \$3.13 to \$3.75 per megabyte, although memory card capacities aren't exact.

CompactFlash. SanDisk's CompactFlash isn't far behind SmartMedia in popularity. It costs about \$30 for 8MB up to \$160 for 64MB (\$2.50 to \$3.75 per MB). The format's main advantage is that it's available in huge capacities, such as Simple Technology's 512MB card priced at a mortgage-gutting \$1,599.

Type I CompactFlash cards measure just 0.13 x 1.69 x 1.43 inches. Type II cards are thicker at 0.20 x 1.43 x 1.69 inches, but can store more data (Type II sockets can also accept Type I cards). Products with CompactFlash slots include Nikon's CoolPix 990 digital camera (\$900), Compaq's iPAQ H3630 PDA (\$499), and RCA's Lyra RD2201 MP3 player (\$149).

A memory card's write speed is important if you have a digital camera with multimegapixel image quality, especially if you want to take one high-resolution photo after another without waiting for the card to save each image. Lexar Media offers faster

Sony showed off three Memory Stick prototypes last November: a GPS (global positioning satellite) module, a digital camera, and a fingerprint recognition device.



CompactFlash cards with write speeds expressed in multiples of 150KBps (kilobytes per second) such as 12X (1.8MBps [megabytes per second]). Your digital camera must be compatible with Lexar's fast cards to benefit from their high

speeds, though.

Pucel says CompactFlash's high capacities will eventually push it past SmartMedia. Stephen Baker, vice president of technology products research at PC Data, agrees. "Certainly from a marketing basis, almost all the flash storage products like digital cameras and MP3 [players] are trending toward CompactFlash versus SmartMedia," he says.

Robert Skeels, an associate research scientist at Synchrotech, notes that third-party products that fit CompactFlash sockets add to its viability. "The new Type II format, which allows for things like the Microdrive, gives it a real capacity advantage over SmartMedia," he says. Because the format has potential for other devices such as tiny modems, manufacturers sometimes refer to it as CompactFlash+ Type II.

Memory Stick. Pucel says that Sony's Memory Stick is also stealing some of SmartMedia's market share as Sony sells more and more digital cameras. This 0.11- x 0.85- x 1.97-inch memory card has until recently only been found in Sony products, but Sony realized it had to recruit other manufacturers to help the Memory Stick format compete (remember Betamax?). Lexar Media makes them now, too, and third-party products such as Epson's 875DCS inkjet printer (\$199) are appearing. In fact, more than 50 companies introduced Memory Stick-compatible products at COMDEX in Las Vegas last fall.

Memory Sticks come in several sizes, from 8MB units that cost about \$30 up to a 64MB variety priced at \$160 or more (\$2.50 to \$3.75 per MB). Variations include the copy-controllable MagicGate and the upcoming Duo, which should be about one third Memory Stick's size. Faster and larger Memory Sticks up to 1GB are in the works.

MultiMediaCard. SanDisk and Infineon co-invented the dinky 0.06- x 0.94- x 1.26-inch MultiMediaCard for really small gadgets. Priced at about \$40 for 8MB up to \$160 for 64MB (\$2.50 to \$5 per MB), the MultiMediaCard appears in Panasonic's PV-DC3000 digital camera (\$899), Compaq's iPAQ Personal Audio Player PA-1 (\$249), and Rockford Fosgate's RFXMP3.8 car stereo CD changer (\$250).

Secure Digital. At 0.08 x 0.95 x 1.26 inches, SD (Secure Digital) cards are thicker than MultiMediaCards but are otherwise similar in size and technology. In fact, an SD slot will accept MultiMediaCards (but not vice-versa). The chief difference is that SD cards can be copy-controlled.

Panasonic's new CQ-SRX7000 car stereo (\$1,400) uses SD cards, as does Toshiba's MEA-110 Digital Audio Player (\$250). Palm announced in June that it would incorporate SD slots in certain PDAs this spring, and Panasonic says its SV-SD75 SD music player (\$400) should appear late this year. Despite these announcements, SD cards are hard to find so far.

PC Cards. Some memory modules come as credit card-sized PC Cards, also called PCMCIA (Personal Computer Memory Card International Association) cards. PC Cards measure 2.14 x 3.37 inches, with thicknesses of 0.13 (Type I), 0.22 (Type II), or 0.41 (Type III) inches. PC Card slots are most common in notebook computers. Thicker slots can accommodate thinner cards.

PC Card memory cards are tougher than PC Card hard drives, but they're not all alike. Skeels says consumers can ignore linear flash and battery-powered static SRAM (static RAM) PC Cards in

favor of ATA (Advanced Technology Attachment) flash cards. Linear flash has largely been relegated to use with industrial equipment, and is disappearing; SRAM cards are very expensive, and require an onboard battery. Synchrotech offers ATA flash cards from 8MB (\$39) up to 512MB (\$906) at about \$1.77 to \$4.88 per MB. Meanwhile, SanDisk has a \$3,760, 1.2GB Type II card.

USB (Universal Serial Bus). Our last solid-state device is also the cutest. The Q Drive from ei Corporation (\$70 for 16MB to \$200 for 64MB; \$3.13 to \$4.38 per MB) is flash memory you can keep on a key chain. It plugs into a device's USB port and, with its driver installed, acts just like any other removable storage device. The Q Drive is color coded by capacity and even has a tiny write-protect switch. Very cool indeed.

Hard Drives

Not all removable storage cards have solid-state memory. Some use miniaturized hard drive technology. IBM's Microdrive, resold by Microtech International, Iomega, and others, is a one-inch hard drive that fits into a CompactFlash+ Type II socket, but you'll need to make sure your particular device can use a Microdrive before you buy one.

Microdrives are generally as fast as 8 to 64MB memory cards. They're actually faster at reading and writing data, but they lose this advantage while "spinning up" their disks. At about \$245 for 340MB, \$400 for 512MB, and \$490 for 1GB (49 to 78 cents per MB), the Microdrive is cheap storage. Meanwhile, PC Card hard drives such as Toshiba's 2.0GB Type II drive (\$599; 30 cents per MB) add even more inexpensive capacity.

If miniature hard drives are so economical, why doesn't every portable device use one? The an-

swer is durability. Hard drives are much more fragile than memory cards, and drain more battery power during use.

Cartridges

Like hard drives, removable cartridges require more battery power than memory cards. They're also slower, but their cheap storage space is powerfully attractive.

Iomega's 40MB Click! disk was never terribly popular, but the company hopes the MP3 craze will change all that. Rechristened the PocketZip, and compatible with Iomega's HipZip music player, its \$10 to \$15 price (25 to 38 cents per MB) makes it a bargain compared to memory cards.

Iomega's hopes may be in vain if DataPlay has its way. Its \$5 to \$12, 250 or 500MB optical cartridge could spark a revolution in portable storage. That's about 2 cents per MB for a cartridge the size of a quarter, and DataPlay's ability to be copy-controlled may win it some support from record companies and other content providers.

Long-Term Memory

Despite its relatively high cost, solid-state memory is the most popular tiny storage option for now, and Pucel foresees prices gradually dropping. "The cost of manufacturing flash is going down about 30% a year," he says, citing new levels of miniaturization and data density.

Whatever type of storage eventually dominates the market, gadget lovers will no doubt see smaller, denser, faster, and cheaper options in the future. ■

by Marty Semis

At about 2 cents per megabyte, think of DataPlay as a coin-sized CD-R.



E-LOAN Gets You The Money Quickly & Easily

Find The Best Interest Rates On Your Next Loan

If you are looking to buy a house or a car or start a business, E-LOAN may get you the best interest rate on your loan. E-LOAN is a loan brokerage company, meaning it monitors numerous lenders and presents you, the loan applicant, with the best rates. Its Web site (<http://www.eloan.com/>) grew from a brick-and-mortar company into the leading Internet-based loan site. E-LOAN finds all types of loans, from fixed and adjustable rate mortgages to auto loans and credit cards.

E-LOAN is a good resource for learning about loan products, the lending process, and how credit ratings work. The glossary gives definitions of financial terms. The site includes numerous tools you can use even if you

are not looking for a new loan. You can compare your loan's interest rate to current market rates, calculate the difference between renting a property and buying a home, and track interest rates on loan products such as fixed rate mortgages or auto loans. E-LOAN automates the lending process, allowing you to learn about and complete your transactions online, saving you money by eliminating loan agent fees.

Own Your Dream Home

The home loan brokerage service is the largest facet of the E-LOAN Web site. Working with dozens of lenders, E-LOAN presents you with a rate comparison for whatever type of loan

The screenshot shows the E-LOAN website with a navigation bar at the top containing links like HOME, SERVICES, ABOUT, and CONTACT. Below the navigation bar, there are several sections: 'A better way to get a loan... without lender fees', 'Personal loan calculator', 'Mortgage' (with a sub-section for 'Fixed Rate Mortgage'), 'Auto Financing', 'Credit Cards', and 'Business Loans'. Each section provides brief descriptions and links to more information. The 'Mortgage' section highlights 'Fixed Rate Mortgage' with details like '15-year', '30-year', and 'Adjustable Rate'. The 'Auto Financing' section mentions 'Avoid haggle and over price' and 'Apply today, get a check and your new car tomorrow'. The 'Credit Cards' section says 'Apply online and get a decision in 35 seconds'. The 'Business Loans' section mentions 'No credit lines. Apply online and get approved instantly. We come to you and close'.

E-LOAN offers borrowers a variety of loan products including mortgages, car loans, and business loans.

you want to take out. Click the Mortgage link to apply for any of the following loan products.

Fixed Rate Mortgage—For this homebuyers' loan, the interest rate does not change over the 15- or 30-year period. Locking into an interest rate protects you from higher rates in the future.

Adjustable Rate Mortgage—This 30-year homebuyers' loan begins at a fixed rate for the first five or seven years, then changes to an adjustable rate for the remaining time. The adjusted rate is based on a preselected financial instrument such as a Treasury Bill or a CD (Certificate of Deposit). The borrower assumes more of the risk since it is possible for the rates to go up; however, the

TIPS ... For Using E-LOAN

Understanding your credit reports is one key to figuring out the loan process. When E-LOAN launched, it provided consumers with free individual credit reports, but the three major U.S. credit bureaus forced them to stop distributing the reports. The E-LOAN site still has fantastic information about how credit reports work. It breaks down the levels of credit (excellent, high risk, etc.), tells how scores are

determined, and explains what factors influence fluctuations in your score.

If you are moving to a new residence over 100 miles away for a job, take advantage of E-LOAN's relocation services. Not only can you get additional discounts on your loan, but the speedy E-LOAN service saves you time with quick turnaround on your application. To qualify for relocation benefits, you have to be a

transferred employee of a corporation who is seeking to finance a primary residence at the new job location.

Look under E-LOAN's Marketplace and you'll find a variety of home services and products from companies partnered with E-LOAN. If you're looking to buy a new house, the Demographic Data is especially helpful, providing you with analysis of neighborhoods, reports

on school quality, and area crime alerts.

Loan applications for different products are not interchangeable. For example, if you applied for a mortgage through E-LOAN, you must re-apply for an auto loan, filling out a new application. Different products' applications are not tied together, but luckily the applications are short and simple to fill out.

lender typically compensates for the additional risk by giving a low fixed rate for the introductory period.

Stated Income Mortgage—This loan does not require proof of income, such as a tax return. A Stated Income Mortgage is most common if you are self-employed or you write off a large portion of your earnings, as do contractors or waiters. The 30-year mortgage comes with five-year, seven-year, 15-year, or 30-year fixed rates.

Home Equity Line of Credit—This adjustable rate product acts like a credit card, with its set limit of revolving credit, but it uses your home equity as collateral. Many homeowners favor this type of product for home improvements or debt consolidation.

Home Equity Loan—Also called a second mortgage, this product lets you borrow as much money as you have equity in your home. E-LOAN offers Home Equity Loans in 15- and 30-year fixed rates.

If you are looking for a home loan, a home equity loan, or a refinanced mortgage, then comparing the various lenders' rates is as simple as answering a few questions about the specific loan you want. Simply fill out the online form fields with information about the type of loan you desire, the loan amount, and the property location and click Search Rates. You'll see a list of four loans with the best rates, showing you the interest rate, points required to pay, and monthly payment amount with the option to click through to detailed loan specifics and closing costs.

To further help you find the best rate, E-LOAN offers the Rate Watch service. You specify the type of loan, APR (annual percentage rate), loan amount, and the location of the property, and E-LOAN will e-mail you an alert when it finds a lender that meets your criteria. E-LOAN hosts a number of helpful calculators, including an amortization calculator and a payment calculator. Finally, by typing information about your current mortgage into the Mortgage Monitor, you can see if another mortgage product is superior to your current one.

If you decide to apply for a loan, fill out a secure form with your personal information and submit it. If you apply Monday through Friday, between 6 a.m. and 6 p.m. PST, an E-LOAN personal loan consultant will call you within an hour of receiving your application. After you're approved, your E-LOAN agent processes the paperwork and makes an appointment for you to sign the closing papers. By the time the papers are signed, E-LOAN has arranged with you the dispersal of the loan money. Even if you don't have a house picked out yet, E-LOAN can pre-approve you for a mortgage.

Get Cash For A New Car

The E-LOAN site also focuses on automobile loans. Click the Auto Financing link to apply for a loan. An installment loan is the typical loan for new and used vehicles. E-LOAN offers you the best rates available from the multitude of lenders working with them. The installment loans available cover new or used vehicles with terms of 36, 48, 60, 66, or 72 months. Refinancing loans are also available if you already have an installment auto loan. Although E-LOAN charges no application fees, you must pay a title transfer fee of up to \$30 if you are refinancing your car loan.

The application process takes place completely online; however, E-LOAN has a toll-free number if you need assistance. Start by specifying the type of loan you want and receiving a custom rate and payment quote. An online form lets you specify the amount you want to borrow and the state where you are buying the automobile. If you already know the car you want, you can also specify the model year, make, and mileage, and whether it is new or used. Click Custom Search, and the next Web page you see is a chart with the various

loan durations and the APR and monthly payment associated with that term. You can tweak the monthly payments by changing the loan amount on-screen and clicking Recalculate. Once you find the loan specifics that you like, you can enter name, address, and e-mail into a secure form to finish the application. E-LOAN then e-mails you the decision in the next 24 hours, often within the hour.

An approved loan application locks in your interest rate for 30 to 60 days, depending on the lender. You'll receive an acceptance package that includes a check for the maximum amount, valid to ward buying a car at any franchised

car dealership, which is a dealer selling new vehicles for at least one domestic or import brand. The vehicle must be a 1995 or newer, must have 75,000 or fewer miles, and cannot be purchased for commercial or business use.

With its additional tools and services, E-LOAN helps make it easier to buy a car. The Carfax Lemon Check lets you type in a car's VIN (vehicle identification number) and your ZIP code to find out a vehicle's history. This free service tells you if anything bad has happened to the car. For the specifics, such as fire or flood damage, odometer fraud, and major accidents, you must pay \$14.95. E-LOAN lets you apply online for loans on antique, classic, and exotic cars through lender J.J. Best & Co. E-LOAN partners with Esurance for your car insurance needs and with online car buying sites Greenlight.com and iMotors.com, giving you the complete range of services for online car buying.

Living Large

Breaking their own model of presenting site users with a comparison of



Search E-LOAN for today's best interest rates on the product you specify.

E-LOAN Fact Sheet

The E-LOAN online loan brokerage grew from the brick-and-mortar brokerage Palo Alto Funding Group. Chris Larsen and Janina Pawlowski founded the company in 1992, changed the company's name to E-LOAN in 1996, and launched the online service in June 1997. Their

goal was to streamline the clumsy loan process, providing a choice of lenders and eliminating loan agent fees, passing the savings along to the borrowers.

E-LOAN went on to become a lender itself, the leading online mortgage originator. They grew their customer service group to

nearly 300 employees and developed an electronic version of nearly every facet of the loan process. The company has partnered with other leading online companies to provide a full array of services to people looking for mortgages, auto loans, and business loans. ■

rates, E-LOAN offers a single credit card choice when you click the Credit Card link. E-LOAN partners with Provident National Bank to offer Aria Visa credit cards. The Aria Visa gives an introductory 0% interest rate for six months and then switches to a variable rate. Based on the information you submit, Provident offers you one of three cards:

Aria Visa Platinum—The introductory 0% APR lasts for three months, after which you pay the variable rate of 0.49% above what the Prime Rate was on the first day of the previous month (Prime Rate was 8.5% on February 1, 2001, so the March 2001 variable rate is 8.99%). APR for balance transfers is 5.49% above the previous month's Prime Rate (13.99% total), and the credit line starts at \$5,000.

Aria Visa Portrait—The introductory 0% APR lasts for two months, after which you pay the variable rate of 10.49% above the previous month's Prime Rate (Prime Rate was 8.5% in February 2001 for a total rate of 18.99% in March 2001). APR for balance transfers is 12.99% above previous month's Prime Rate (21.49% total). Your credit line is up to \$2,000.

Aria Visa Persona—The introductory 0% APR lasts for two months,

after which you pay 23.99%. Your credit line is up to \$1,000. Based on the information you provide there may be an annual fee up to \$89.

You can apply for the cards online by filling out a form with your name, address, phone number, social security number, birth date, and annual income. The approval process takes less than a minute; 30 seconds according to the Web site. Once you have an account, you can access the balance and transaction history 24 hours a day through an online interface or by calling a toll-free number.

When you buy something with the Aria Visa card, you earn points that you can redeem online through Aria's Web site (<http://aria-rewards.mypoints.com>). You can redeem points for gift certificates to retailers, such as Eddie Bauer, Blockbuster Video, and Circuit City. You instantly get 250 points for signing up for the card and you receive two points for every dollar you spend. Balance transfers tender 5% of the total dollar amount in points, up to 1,250 points. You can start spending your points on products after accumulating just 750 points.

E-LOAN partners with LiveCapital, a provider of real-time credit and financing for businesses, to get would-be business owners the best rates on loans,

lines of credit, equipment leases, and business credit cards. Click the link to Business Financing and fill out an online form, which requires more extensive information than the home and auto loan forms. LiveCapital generates a list of potential offers based on its evaluation of your application, your credit report, and your business' credit reports. You then select your first choice, and LiveCapital finalizes the offer with the lender. The offers come from a pool of over 70 lenders, such as Citibank, Wells Fargo, and American Express. Financing is available from \$10,000 up to \$20 million with instant decisions on requests of up to \$75,000. When approved, you'll receive checks for immediate use.

E-Track lets you access information about your loan 24 hours a day through the link to E-Track Online Loan Status. Click either Home or Auto, enter your loan number and password, and click Login. You can track your loan from the time you apply until the time it closes. The page lets you know when E-LOAN receives your documents and which documents are still missing. Customer service is available for live help via Web chat on Monday through Friday, from 8 a.m. to 6 p.m. PST. You may call a toll-free number Monday through Friday, 6 a.m. to 6 p.m. PST for mortgages; Monday through Friday, 7 a.m. to 6 p.m. PST for home equity loans; and Monday through Friday, 5 a.m. to 7 p.m. PST and Saturday and Sunday, 6 a.m. to 3 p.m. PST for auto loans.

My E-LOAN

My E-LOAN is a personalized Web page that lets you track up to five loan products, displaying the day's best interest rates. Enter your name, e-mail address, and the products you want to track and sign in with your username and password. You can also set up alerts that will appear on your personal page when your loan products reach a certain interest rate or lower. From there, applying for the loan you have found is only a click away. ■

by Greg Schick



E-Track lets borrowers monitor their loan's status, keeping up with documents they need to sign and closing deadlines.

Web Tips

Ideas That Make The Most Of Online Time

Virtual Briefcase

Yet another reason to like Yahoo! is its free Briefcase, which lets you upload files and photos that you can access from any computer with an Internet connection. To set up your Briefcase, go to My Yahoo! (<http://my.yahoo.com>) and click the Briefcase link in the Inside Yahoo! Section, then click the Sign Me Up! link on the next page. Enter your personal information on the next page, choose an ID and a password if you don't have them, and click the Submit This Form button. Once registered, access your Briefcase at <http://briefcase.yahoo.com>. Click Add File and Yahoo! helps you upload a file to its secure servers. Sign in to your account from any computer to read, edit, save, or delete your files.

What's A Word For...? Dismal Gas Prices

Language is woefully inadequate for expressing some of the events, feelings, experiences, and concepts that shape our lives. Word Fugitives (<http://www.theatlantic.com/language>; click Word Fugitives) is an "interactive column" provided by the *Atlantic Monthly's* the Atlantic Online that attempts to unite these concepts, experiences, and emotions with words. Look through columnist Barbara

Wallraff's America's 10 Most Wanted Words list, and if you have a suggestion, click the Post & Riposte link (you'll have to register the first time) to

month, and a year ago for Regular, Medium, and Premium Unleaded and Diesel fuel. If you are planning a car trip and you're curious about gas prices along the way, enter ZIP codes along your route to compare prices and see if it may just be cheaper to fly.

What's For Dinner?

Who wants to hear *that* after a long day at the office? Go to the Recipe Finder

require a trip to the market.

Golf Pro

We don't need to know your handicap and neither do the folks at Maximum Golf (<http://www.maximumgolf.com>) if you want to go on an 18-hole Golf Trivia Tour. Click Max Trivia and register. It's free, and you can sign up for the two, 18-hole tournaments held each month. Each tournament includes nine holes and spans two weeks; you play the front nine during the first week and the back nine during the second. You're competing against other "golfers," and you can track your standings on the Leaderboard.

Keep Up With The Joneses

Whether you're thinking about putting your house on the market or are simply curious about what houses in your neighborhood are selling for, you'll like the Spy On Your Neighbor feature at [homestore.com](http://www.homestore.com) (<http://www.homestore.com>). Click the Finance & Insurance tab and scroll down to the Spy On Your Neighbor box. Type your street address (or your neighbor's if you just can't help yourself) and ZIP code in the appropriate fields and click GO. You'll see a list of the most recent selling prices for homes on your street or in your neighborhood. Also, click the Check The Price History Of Your Home link to see how your home's value has increased (hopefully) over the years. ■



The Dismal Scientist lets you compare the gasoline prices in your ZIP code to the U.S. national average.

share your linguistic epiphany with the rest of the world.

As travel season nears, you may want to see if you'll be gouged at the gas pumps again this summer before planning that road trip to Disney World. Economy.com's the Dismal Scientist (<http://www.dismal.com>) offers comparisons of average gas prices in your area to national averages. Enter your ZIP code beneath Gasoline Prices and click GO, and you'll see averages for the current month, the previous

(<http://food.women.com/food/recipes>) at Women.com to search for delicious, nutritious, and easy-to-prepare recipes. Click the boxes next to the Type Of Dish (soup, main dish), Main Ingredients (Meat, Fish, Pasta), Cuisine (American, Asian), Calorie range, Preparation Time, and Complexity you're interested in, and click Search. Better yet, click the What's In Your Fridge link, enter a Primary Ingredient and several Secondary Ingredients, and click Search. The Recipe Finder will serve up a handful of ideas that won't



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Use Dazzle's new MovieStar software to create professional looking videos and save them on a VHS cassette, CD or even a DVD.



Webcast Theater

Post your finished video on Dazzle's Webcast Theater and your friends can quickly view your masterpiece as streaming video.

Dazzle: #1 in Digital Video

Dealing With Desktop Systems

Our Buying, Performance
& Troubleshooting Advice For PCs

FOR ALL THE POWER

and potential a PC possesses, it really can be a fairly delicate beast. Mistreat, neglect, or fail to give it the attention it needs and it will vent its disapproval by malfunctioning. But even users who dutifully care for their personal computers will encounter hitches eventually.

We've smacked into numerous problems with systems over the years while testing and reviewing hundreds of computers in our hardware lab. Many conflicts we corrected with a simple twist or turn. Other snafus required a more analytical approach. Pinpointing exactly why a monitor won't display an image or why software won't install can be incredibly frustrating, but it's also educational.

Throughout our testing and reviewing endeavors, we've learned a lot about PCs and the manufacturers who make them, including specific characteristics of certain makes and models, how to remedy certain problems, where to seek assistance, and how to prevent some problems from occurring. We've also acquired buying knowledge for what to look for in a PC and things to possibly steer away from. Below are some tips and general bits of information we've amassed from poking and prodding around scads of computers over the years.

Get The Right Stuff

We're spoiled in that we see and use many new PCs before they become readily available to consumers. In that regard, many manufacturers send us

systems stocked with their biggest and best components. One thing we've learned is there is such a thing as overkill. Many systems we see are entirely too much machine for users with basic needs.

Before you buy a new computer, we suggest you detail what your primary uses for it will be, and then map out what it should include. Unless you'll play Quake III for hours every day, we can't justify spending thousands of dollars to get the top-flight components it takes to fully enjoy serious gaming.

We'd be lying if we said gaming on a 1GHz-charged system with the latest NVIDIA graphics accelerator using 64MB of video RAM isn't a riot, but it's definitely not practical for someone who plans to primarily just surf Web sites and send e-mail. A system hovering around the \$1,000 mark can handle those tasks just fine.

In addition, we don't recommend buying the fastest processor available. You can save hundreds of dollars going with a slightly older and slower processor, and you won't typically notice a dramatic difference in performance. We use several benchmark tests to measure performance. We obviously see sharp differences in test scores between a 1GHz machine and a 500MHz system, but there usually isn't a huge difference between a machine running at 900MHz and a comparable system with a 750MHz processor.

Conversely, we almost always notice a significant difference between comparable systems using different amounts of RAM. For example, a machine with 128MB of RAM almost always easily surpasses a comparable system with 64MB of RAM. There may not be an easier way to improve your PC's performance than increasing the RAM. After doing so, a good indicator that performance has improved is the ability to simultaneously run more applications more smoothly.

If you install new RAM and experience problems later, such as video-related errors, check that the RAM you installed was the right type. We've found a lot of errors we didn't think were related to RAM were corrected by swapping out the RAM cards.

Also, there are different types of RAM, and they are priced differently. Most systems ship with SDRAM (synchronous dynamic RAM), but there's also RDRAM (Rambus RAM) and DDR SDRAM (double-data-rate SDRAM). RDRAM and DDR SDRAM are considered faster memory types, but both are generally more expensive and can drive up the system's price, especially in the case of RDRAM.

In our tests, we tend to see a noticeable leap in performance with systems using RDRAM over comparable machines using SDRAM. However, the price is usually at least \$150 or more. In some industry circles, RDRAM isn't considered dramatically better than cheaper DDR SDRAM.

Finally, if you're considering upgrading to or buying a system using Intel's latest Pentium 4 processor, know that it only supports RDRAM memory. Pentium 4s supporting DDR SDRAM and SDRAM aren't expected until later this year.

Detailing Daring Designs

A current trend in desktop systems is an increased focus by manufacturers on venturing away from standard box-like beige designs to more contemporary designs with more visually appealing contours, curves, colors, and sizes.

We're in favor of aesthetically pleasing systems, but many of these systems achieve their stylish looks by omitting a few things, primarily expansion abilities. For example, we haven't seen a more striking computer in the past year than Apple's translucent Power Mac G4 Cube. However, the computer omits a 3.5-inch diskette drive and has no available PCI (Peripheral Component Interconnect) card slots or drive bays. It also has an interior that is difficult to access and work on.

Compaq's legacy-free version of its iPAQ computer is also an attractive, space-saving machine, but it omits drives, bays, and PCI and ISA (Industry Standard Architecture) slots. Instead, it has one bay to swap between a DVD-ROM, CD-ROM, SuperDisk LS-120, or additional hard drive. Models like IBM's NetVista Legacy Free S40 go as far as eliminating serial and parallel ports in favor of using only USB (Universal Serial Bus) ports for connecting peripherals.

Many of these systems use an all-in-one design, which means the case isn't built for opening. If you're considering a legacy-free, all-in-one type of system, know they rely heavily on USB connections for expansion and you'll find it difficult, if not impossible, to increase RAM or upgrade the graphics, sound, and modem capabilities.

If appearance doesn't concern you, consider mixing and matching the components and peripherals to customize a system to your needs. Shop around for parts. Most manufacturers give you some customizing ability, but the options are often limited to buying only products made by that manufacturer. For example, eMachines usually packs a lot of features in their sub-\$1,000 systems, but we'd rather use third-party speakers and monitors than the

digital camcorder to transfer video for editing tasks especially fast and easy. Most eMachines systems have a joystick port at the front for gaming, while many Hewlett-Packard systems have a serial port at the front to easily connect to a digital camera or other peripheral. We find these options to be much easier to access than having to weave a cable around the chassis' back to make a connection. We also find keyboards that have USB ports built into the side to be great for connecting a USB mouse or other device.

Airing Things Out

In general, we prefer a system have at least one open PCI card slot and one open drive bay for expansion, even if you think you'll never use them. As fast as technology develops, evolves, and advances, you might have to make upgrades to keep your system viable.

The amount of expansion ability you need depends on what type of user you are. Dell and Micron generally make the best systems we've seen for expansion because both companies produce systems with spacious interiors that are easy to access and work on. Even their low-end systems usually have roomy interiors that make reaching a RAM

We've found a lot of errors we didn't think were related to RAM were corrected by swapping out the RAM cards.

ones eMachines produces. Make sure the parts you're using are compatible before going this route.

In our testing, we also find a chassis with external features that match particular needs to be beneficial. For example, Compaq's recent Presario 7000 has two USB ports and a FireWire (IEEE 1394) port at the chassis' front. The FireWire port makes connecting a

slot, drive bay, and card slot with two hands easy, even for novices.

If you're working on the interior, disconnect the power and modem connection and ground yourself by touching a metal edge. Some systems require moving cords, wires, and ribbons out of



the way to reach a card slot. Others require disconnecting and moving the power supply aside, which is more involved. Better systems we've seen recently have sliding tabs that release the drives without the need of tools.

Ventilation is something you should also inspect and maintain. In our labs, we look for systems that have a fan or funnel built directly on the processor to cool it and additional fans at the front and back to cool the motherboard and the rest of the interior. Typically, air is pulled through vents and blown across the motherboard by the fans. Air is usually drawn out of the system with a fan by the power supply. Dust will collect at this area and should be periodically cleaned (after unplugging the system). Also, consider replacing the primary fan about every six months. We've found this typically costs about \$10 but can lengthen a system's life and benefit the motherboard.

Storage and drives are other areas where you can benefit from expanding. Entry-level systems now include hard drives as large as 20GB or more, and some low-end systems we've seen offer both DVD-ROM and CD-RW drives. Bumping storage space up an extra 5GB to 10GB isn't terribly expensive but can be extremely useful if there will be multiple users, such as children or teenagers installing games and downloading MP3 files. We suggest keeping your hard drive as free as possible of MP3 files and digital images, because they can be difficult to organize and they exhaust space quickly.

Odds & Ends

Some lessons we've learned about systems are really a matter of common sense and good judgment, yet they often get overlooked. For example, systems with built-in speakers nearly always produce horrible audio but many users assume any set of speakers will output decent sound. In our labs, we isolate the treble, bass, and volume to get an idea of a speaker's range and ability to produce full tones. We also crank the volume way up and listen

using headphones. If you hear crackling or hissing, it will only get worse and more annoying with time. We also play several 3-D games to judge the quality of special effects and surround sound.

Many low-end systems use audio and video that's integrated into the motherboard instead of using a separate soundcard and graphics accelerator card inserted in an AGP (Accelerated Graphics Port) slot. Such systems typically use small amounts of video memory that is usually shared with the system's overall memory. For example, a system may have 8MB of video memory, but that 8MB is taken from the system's overall 64MB of RAM. You'll see a big drop off in quality while gaming and watching DVD movies.

In general, integrated video is fine for running basic home office applications or Internet tasks. In addition, we've seen good improvements in performance with the introduction of Intel's 815E chipset used with Pentium III and Celeron processors. The chipset has specific designs geared to video performance and it uses integrated video; however, it also lets users install a separate graphics accelerator card. In our tests, systems with the 815E chipset have outperformed other chipsets geared to integrated video. Currently, Dell's Dimension 4100 uses the 815E chipset and is the best performing system we've seen in its price range.

Beyond chipsets, some manufacturers use configurations unique to their machines. For example, many HP systems we've tested split the sound card in two by putting the audio input, output, and microphone ports on one card and the joystick and speaker out jack on the modem. The configuration doesn't hurt performance but makes upgrading the soundcard more difficult.

If you have trouble with a particular peripheral's performance, don't automatically assume it's the peripheral. It could be the system. Install the peripheral on another computer. If it fails, the problem is probably the peripheral. If not, it's probably the system. Also, check for loose cables and cards before assuming the computer is faltering.

It's also good to check a manufacturer's technical support system before buying. We use tech support often and run into a lot that is bad. Actually call the tech support a couple of times to determine the delays you can expect to encounter. Also, examine the company's online support and availability of

upgrades and drivers, and determine what the policy is for getting software support. Some manufacturers have pushed us off to the software maker for support, which isn't always free.

Also, check the company's stability if you're not buying from a major manufacturer. In the past year we've reviewed systems from CyberMax Computers and Quantex Microsys-

tems that were generally good systems. However, the major supplier for both companies reportedly filed for Chapter 11 bankruptcy in fall 2000. Trying to get support from CyberMax or Quantex now will only lead you to dead Web sites and disconnected phone numbers.

Overall, there's a lot to consider when buying a computer and much more to keep track of after you begin to put it to use. Much of what we've learned about systems has been through trial and error and repetition. The more you use your system, the more ways you'll find for improving performance and keeping things running smoothly. ■

by Blaine Flamig

Notebook Notes

**What To Look For,
What To Avoid
& How To Get Along**

LIKE MOST TYPES OF COMPUTERS and electronic equipment, notebook PCs are amazingly complex devices built from equally complex components. As a result, there are lots of things to learn in order to use them effectively, and there are also a good many things to consider when buying one.

Over the past several years the lab crew here at Smart Computing has unpacked, poked, prodded, tested, and used a vast number of notebooks from the industry's leading companies. They were kind enough to pass on to us some of the nuggets of wisdom they've accumulated, and in turn we've compiled them below for your perusal.

Choosing The Right Notebook

The type of components and how the notebook manufacturer puts them together affect the way it operates. For

instance, many models come with speakers set into the wrist rest panels beneath their keyboards. In some cases this may be unavoidable due to a lack of space elsewhere. The problem, however, is that your wrists will likely obscure the speakers at least partially when you type, muffling and quieting the sounds.

Good picture is probably even more important than good sound for most users. Active-matrix LCD (liquid-crystal display) screens typically are brighter and clearer than passive-matrix screens, and because they usually come with higher-priced notebooks, they often have the benefit of better video control chipsets. The end result is higher resolution, a higher refresh rate (the amount of times the screen is redrawn each second; higher rates reduce eyestrain), and a better picture.

While we're discussing notebook displays, we should point out that the

lid panel behind your notebook's display bears the burden of protecting its most expensive component, so try to pick a notebook with a good lid panel. When comparing models, grip a prospective candidate's lid firmly by both hands and gently twist (with the power on). A few ripples moving across the screen are normal, but if dark ripples that take longer than a few seconds to disappear cover the screen, the lid panel might be a little soft. In cases such as this, frequent travelers should plan on using well-padded carrying cases and lots of TLC.

Upgradability is another big design issue. Notebooks are generally tougher to upgrade than desktop PCs, but some models let you make significant changes over time. Most, for example, let you add more RAM as needed (in some cases up to as much as 576MB). Notebooks with modular device bays are also nice. If you decide a few months after purchase that you should have opted for a DVD-ROM or CD-RW (CD-rewritable) drive instead of a vanilla CD-ROM drive, you can usually buy one from the manufacturer and pop it right in.

By the way, when you're considering what sort of optical drive to order with your notebook, we'd recommend choosing a CD-RW drive over a DVD-ROM drive. If you want to watch movies while you travel, the DVD drive is fine, but there is very little software available in DVD format. Additionally, a CD-RW drive provides a great way to store personal data at 650MB at a time.

One important component you can't upgrade as a rule is a notebook's graphics control chipset, so it's important to get a good one when you buy your notebook. We'd recommend getting a unit with the best graphics controller (and one with the most memory) you can afford, keeping in mind that an extra 4MB of video memory can make a dramatic difference. Also, if video performance is vital, try to steer clear of notebooks with video chipsets that don't have

dedicated video RAM, but instead share a small portion of your notebook's system memory.

Battery Life & Power Management

Keeping your notebook running when power outlets aren't available requires help from a rechargeable battery, and there are lots of things that can affect your battery's ability to do its job. If you've unpacked your shiny new notebook PC and it refuses to run on battery power, check the battery bay carefully. Several companies ship their notebooks with a removable plastic strip between the removable battery's contacts and the contacts built into the bay as a precautionary measure. You will probably find a tab you can pull to remove the strip so you can begin charging the battery for use.

Sometimes your battery works but doesn't last as long as it should. If you're not getting the battery life you expect from your Pentium III notebook with Intel's SpeedStep power optimization technology, check its SpeedStep settings. Some notebooks (several Compaq models, for example) arrive at our testing labs with SpeedStep power optimization turned off by default. To turn it on, look for a SpeedStep or battery control icon that appears either in the System Tray on the right end of your Windows Taskbar or in your Windows Control Panel (click Start, point to Settings, click Control Panel). Clicking this icon opens a power management application that lets you control your notebook's SpeedStep feature.

If you're worried about battery life, you can usually extend the life of a battery charge somewhat by turning down the brightness setting of your display. This won't double your notebook's battery life, but it's often one of the first thing manufacturers ask us about when discussing our testing procedures.

One thing you shouldn't worry about is listening to music CDs if your notebook has external CD player controls. It's natural to think that listening to music CDs constitutes a substantial

drain on a notebook's battery life, but our experts indicate that's not the case. Because most external CD player controls let you listen without turning on your notebook's main power, you should be able to listen for a few hours on very little power.

General Use & Maintenance

The good folks in our labs have made lots of interesting observations over the years about basic things you can do to make your portable computing experience better. Not all these tips are of the earth-shattering variety, but we think you'll find some of them useful. If, for example, you're lucky enough to own one of the luxurious notebooks that come with both touchpads and pointing sticks, you should check the configuration options available to you in Control Panel or from your System Tray. Some units let you disable whichever device you don't use to avoid bumping it and inadvertently moving your pointer.

Your System Tray may also hold a cure for speakers that don't get as loud as you'd like. If you turn your notebook's volume control dial or buttons all the way up and the speakers are still too quiet, click the speaker icon toward the right end of your Taskbar. An audio control panel should appear that lets you adjust a variety of audio settings, including CD Audio and Master Out or PC Speakers. Clicking and dragging the volume levels below the appropriate labels can help make your notebook's speakers produce more volume.

Speaker volume isn't the only thing you can kick up a notch. As we mentioned earlier, most notebooks let you add memory up to a certain point, and Notebooks with mobile PIII processors require lots of memory to keep them running at top speed. Our labs' performance tests show fairly conclusively that PIII notebooks with only 64MB of RAM produce substantially lower scores than do similarly-equipped units with 128MB. In some cases performance can vary by as much as 30% to 40%.

Hot Tips

1 Notebook shoppers who like to listen to music while they type should watch out for notebooks with speakers built into their wrist rest panels.

2 Manufacturers sometimes ship notebooks with Pentium III SpeedStep processors with SpeedStep power optimization turned off by default. Users who aren't getting the battery life they expect should check these settings.

3 Playing music CDs with your notebook's external CD player controls doesn't use as much power as you might suspect; the CD players usually don't require you to turn on your notebook's main power.

4 Notebooks with Pentium III processors perform substantially better with 128MB of RAM than they do with 64MB (as much as 30% to 40%).

5 You can probably reconfigure your notebook's one-touch application buttons to launch your favorite programs or open your favorite directories.

You may be able to increase productivity by 30% to 40% by making effective use of the one-touch application buttons that many companies are currently adding to their notebooks. The buttons usually come preconfigured to launch things, such as your Web browser, your e-mail application, and proprietary help programs. In most cases, the buttons come with applications (often located in Windows' Control Panel) that let you reassign them to launch programs or open directories you use most frequently.

Trial & Error

Although our lab technicians are experts, they made several of the observations listed above in the course of doing the same things with notebooks you do with them. Don't be afraid to experiment with your notebook's features; it's the best way to get to know them, and Windows' error messages make it pretty hard to do any permanent damage. **II**

by Chris Trumble

Pro Tips For Inkjet & Laser Printers

Keep Your Printer Humming With Help From Our Labs

ON ANY GIVEN DAY, there's at least one inkjet or laser printer in our testing labs, and probably more. Consequently, our testers have some definite things to say about them. Their tips cover a range of topics, but they will help you avoid learning some printer lessons the hard way. As a bonus, as almost every MFD (multifunction device) on the market is based on inkjet or laser-like technology, MFD users will find these tips helpful, as well.

Inkjets

How can inkjet manufacturers make money from sub-\$80 printers? By selling you replacement ink cartridges with high profit margins. Cheaper inkjets almost always cost you more per printed page than more expensive models when you factor in the cost and page yields of their ink cartridges.

Because of this, you might decide to use refilled cartridges from vendors such as Pacific Ink (<http://www.pacificink.com>). It's really up to you if a refill's price and print quality make it a good deal, but your printer's manufacturer is probably dead set against the idea. Leaving the profit motive out of the argument, some manufacturers warn against air bubbles or fine particles in the ink resulting from the refill process, as well as ink that isn't as water- or fade-resistant as their own.

Some printers, such as Canons and Epsoms, have printheads you should change every so often, perhaps every third or fourth time you change their ink tanks. This keeps their pages looking sharp. The ink cartridges in Hewlett-Packard printers have print nozzles built in. HP's cartridges may cost a little more to make, but they are all you should ever have to replace.

Whenever you replace ink cartridges, don't forget to align the color and black printheads with the manufacturer's utility. This will keep your color prints from looking like a bad batch of Sunday comics. Some brands automatically launch the utility whenever you remove and replace a cartridge.

Also, if you don't plan to use your inkjet for several months or more, it's best to remove its ink cartridges and store them in the manufacturer's flip-top container, if one came with your printer. If not, our testers suggest carefully applying a piece of tape across each cartridge's print nozzles or ink hole. This isn't the most elegant solution, but it could keep an expensive ink cartridge from drying out.

Laser Printers

Our testers pointed out that laser printers are usually larger and heavier than inkjets and have more complex moving parts. They generate a lot more heat, too. Give your laser some breathing room. Don't push it against a wall or crowd it with other equipment.

Also, take the time to clean your laser every so often, following the manufacturer's instructions. Stray toner particles, paper debris, and lint can accumulate inside it. Carefully vacuum your laser's problem areas once in a while or blow them out with compressed air.

Laser printers have more replaceable parts than inkjets, all of which affect its print quality. All lasers have an OPC (optical photoconductive) drum, which is a cylinder that attracts toner in the image of the printing document and then rolls it on to a fresh piece of paper. OPC drums usually last longer than toner cartridges, but they do need to be replaced sometimes. Some manufacturers build the OPC drum into the toner cartridge. This bumps up the cartridge's cost, but it cuts down on items you need to worry about replacing.

Some lasers, especially color models, have other consumables for you to replace. Some have separate

containers for developer, a magnetic powder that helps the toner go where it needs to. Others use silicon-based fuser oil to keep the toner on the page when the heated fuser roller melts it into the paper. Replace these when the manufacturer recommends it and give your laser prints back their edge.

The fuser roller we just mentioned is the reason for another sticky point for laser printer users. Some manufacturers tell you not to feed a printed page back through to print on the other side. Although some printers are able to duplex (print on both sides of the page), others will make a mess by remelting the dried toner on the page. You should only try to duplex if the printer's manual says it's OK.

Sometimes an "empty" toner cartridge really isn't. Remove it from the printer, hold it over a garbage can, and tip it end over a few times to spread the toner around. Put it back in the printer, and you will probably get some more life out of it.

When your laser's first toner cartridge runs out, you will need to decide if you'll buy a new cartridge, refill your old one with a kit, such as RechargX (<http://www.tonerrefillkits.com>), or buy a refilled cartridge from a vendor, such as Verbatim (<http://www.verbatim.com>). Printer manufacturers would rather have you buy their cartridges, which means residual revenue from every printer they sell. In their defense, a cartridge refilled with substandard toner

or one with a worn-out OPC drum will print some ugly pages. This might make users who are unaware of the finer points of toner replacement think less of the printer itself.

If you buy a new toner cartridge instead of using a refilling service, ship back the empty cartridge if the manufacturer wants it. Some companies pack a postage-paid shipping envelope for the old cartridge in the same box as the new one. Similar to the "cores" of car parts that garages send back to the manufacturer for rebuilding, old toner cartridges can be refilled and resold without ending up in a landfill.

Finally, be sure that a laser printer fits your future needs. If you're likely to network your office, it may be cheaper to buy a networkable laser now, rather than one with an expensive optional network card you'll have to buy later. Also, if you need PostScript support in a printer, get it up front. When upgrading PostScript after you've bought the printer, you usually have to add proprietary RAM or a hard drive to your laser. Neither option is cheap.

General

Some tips apply to either type of printer. Watch the paper you feed into your printer. Some printers can't handle heavier weights of paper (expressed in pounds, such as 20lb. bond). Others require you to throw a lever before you feed it heavy stock or envelopes. Use the appropriate flip-up guide rails in the printer's paper path when you feed it odd-sized things, such as 4 x 6-inch photo sheets, envelopes, or index cards.

Some dirt-cheap or recycled paper may make financial or environmental sense to you but may not make sense to your printer. Some inferior papers may gum up your printer with particles or make its prints look terrible. Speaking



HP's LaserJet 4050TN (\$1,629) comes with 10/100Base-TX Ethernet, Fast Infrared, and PostScript Level 2 support out of the box. Pair its economy with Lexmark's Z52 Color Jetprinter (\$180) for occasional color prints, and you'll have a killer combo.

Hot Tips

- 1 If you're not going to use an expensive, open ink cartridge for a long time, taping over its nozzles is better than nothing to keep it usable.
- 2 Check to see if your printer has other things to replace besides ink or toner.
- 3 Laser printers produce a lot of heat. Keep a clear space all the way around yours for ventilation.
- 4 Garbage in, garbage out: Don't expect world-class prints if you're using sub-standard paper.
- 5 Don't forget to clean out your printer's accumulated dust, lint, and other dreck every so often.

of terrible prints, you may need to experiment with different kinds of paper to get the best pages. You might be surprised how many mediocre printers come alive with a change of paper.

Another trick is to fan a stack of paper with your thumb before you load it into the input tray. This may keep new paper from sticking to itself and causing a jam. Of course, you should never feed any printer torn, folded, or stapled paper. Also, be careful to correctly load any paper that's coated on one side only. It's embarrassing to waste a few dollars' worth of color ink on the back of a dollar sheet of photo paper.

Many printers have some sort of automatic cleaning cycle. Although it may use up some ink or toner, you can use it to correct some common print problems such as smudging.

Finally, when choosing a printer, take a realistic look at your needs. Home users almost always do well with a quality inkjet, and high-volume environments demand the economy of a monochrome laser. Color lasers are a good choice if your workplace demands a lot of color prints. Still, if a color laser's complexity and price outweigh the low demand for color prints in your office, consider a \$150 to \$200 inkjet along with a suitable monochrome laser for the best of both worlds. ■

by Marty Sems

Stay Connected

Find & Fix Modem Problems

sure Windows supports USB. Windows 95 (before Service Releases 2.1 and 2.5) and Windows NT do not provide support for USB.

If your modem is listed in the Modems

Properties window, you may have a hardware conflict. The most likely suspect is an improperly configured IRQ (interrupt request line) or COM (communications) port. Right-click My Computer from your Desktop and select Properties.

Click the Device Manager tab. If you see a yellow exclamation mark (!)

next to the entry for your modem, you have a device conflict (most likely an IRQ conflict). See "IRQ Conflicts" on our Web site at <http://www.smart-computing.com/oct99/irq> for information about resolving IRQ conflicts.

Notebook users may have problems installing a PC Card modem if it conflicts with an onboard modem. You can solve this problem by disabling the onboard modem. From Device Manager, select your modem and click Properties. Check the box next to Disable In This Hardware Profile and click OK. After restarting your PC, the onboard modem should be disabled, letting you properly install the PC Card modem.

Connection Problems

You should never expect to connect at the maximum connection speed for your modem. A V.90 modem, for instance, is capable of connecting at speeds of 56Kbps (kilobits per second), yet typically connects speeds are in the mid to high 40s.

Something's wrong if you're connecting at a much lower speed than your modem is capable of or if your modem dials out but can't connect. If

you have an external modem, check the connections and the power. Many modems have a line in and a phone jack. Make sure the telephone cable runs from the wall jack to the line-in jack on the modem. Download the latest modem drivers from the manufacturer's Web site. The phone number your modem dials for service may change, so call your ISP to confirm that you're still dialing the right number. If the problem has just started, think about recent changes to your PC or your environment. A new baby monitor or answering machine, for instance, could interfere with your modem.

Line noise from a poor-quality telephone line can interfere with connection speed. Connect a phone to the same jack as the modem. If you hear background noise, contact your telephone company to see if it can eliminate some of the line noise. If the line is quiet, contact your ISP to see if it's having problems. If your ISP doesn't find a problem, contact the modem manufacturer for support. ■

by Chad Denton

Hot Tips

1 Plug and Play usually configures new modems. If Plug and Play fails, you may have to manually configure your modem.

2 If your PC Card modem interferes with the onboard modem, try disabling your onboard modem from the Device Manager.

3 If you connect an external modem to your PC using USB, be sure the operating system you're using supports USB.

4 Maximum connection speeds are theoretical limits that can be obtained under ideal conditions, but it's not likely you'll connect at the maximum speed.

5 If you can't connect, troubleshoot what you can from your end. Check your connections, software, and the phone before you contact your phone company or ISP.

ALTHOUGH BROADBAND

INTERNET CONNECTIONS, such as DSL (Digital Subscriber Line) and cable modems, are becoming more widespread, the majority of us still access the Internet over a traditional analog modem. Many of these connections are slow enough without technical problems interfering. To make matters worse, modems communicate with the outside world, making it difficult to tell if the problem lies on your end, with your phone company, or with your ISP (Internet service provider).

Configuration Problems

Detection and configuration problems are the most common problems you may encounter. Open the Control Panel (click the Start button, choose Settings, and click Control Panel) and double-click Modems to open the Modems Properties window. If there's no modem listed, then Windows is not detecting your modem. Check your connection and make sure the power is on if you're installing an external modem. If you are connecting to a PC through a USB (Universal Serial Bus) port, make

Platter Matters

Tech Tips To Tweak Your Hard Drive

TIPS FROM OUR LAB

TESTERS are a little more technical than our usual advice. Still, there's something here for most users. As always, use caution and back up your system before making changes.

Coolin' It

If you have a 10,000rpm (revolutions per minute) or faster SCSI hard drive, mount it in a case with cooling fans, such as those from StarTech (<http://www.startech.com>). A cooled drive lives longer than one baking in its own heat.

Partitioning

Many users partition their drives into sections, each with its own letter, such as C: or D:. This practice lets you install applications and saved data to different partitions (say, D:) than the one holding your operating system. Partitioning minimizes data loss and effort if you have to reinstall your OS.

More important, setting smaller partitions on most hard drives makes them use their space more efficiently. Divide

your FAT32 (file allocation table 32-bit) drive into 6GB or smaller partitions to be able to pack the most data on it. If you're using FAT16 (16-bit), partitions up to 127MB are best, but 255MB partitions are also pretty efficient. If your hard drive is 1GB or larger and you have Windows 95 OSR2, Win98, or WinMe, FAT32 may be a good switch.

You can partition a hard drive as you install it using DOS's FDISK utility. To partition a drive with Windows already installed, use a third-party utility, such as Partition Magic 6.0 or Partition Commander 6.0. Always run Disk Cleanup, ScanDisk, and Disk Defragmenter (or the Maintenance Wizard in Win98 and WinMe) after moving or re-sizing a partition.

Swap Files

Windows PCs use virtual memory, or a swap file, which is hard drive space set aside to supplement the RAM. Windows continually changes the size of the swap file as needed, which slows down your system. If your system has hard drive space to spare, speed it up by fixing the swap file size.

In Win98, for example, right-click My Computer, Properties, and the Performance tab. Click Virtual Memory and the Let Me Specify My Own Virtual Memory Settings radio button. Enter 100 in the Minimum and Maximum blanks to freeze the swap file at 100MB. Click OK, Yes (ignore the warning), Close, and Yes to reboot. If you're a gamer or audio/video user, or if you

encounter Out Of Memory errors, increase the minimum and maximum values to 125, 150, or more.

Some users set the swap file on a new partition (before installing anything else there) by choosing its drive letter in the Hard Drive blank. Better still, if you have two hard drives, put the swap file at the beginning of the second drive before you install any other software on it.

Once you've mandated how much hard drive space can emulate RAM, set the amount of RAM that can act like hard drive space, called vcache (virtual cache). Otherwise, Windows wastes time adjusting this, too. Click Start and Run. Type sysedit and press ENTER. Click the C:\WINDOWS\System.ini window and scroll through its contents until your cursor is one line under [vcache]. Type minfilecache=n ("n" being the product of your RAM in megabytes multiplied by 128; for example: 16,384 for 128MB), press ENTER, type maxfilecache=n (the same number), and press ENTER again. Click File, Save, and close the System Configuration Editor window.

If you encounter cache or memory errors, increase your vcache settings by 2,048, 4,096, or more. If your system doesn't like these changes, reverse your steps and let Windows handle your vcache and virtual memory settings. ■

by Marty Sems

Hot Tips

- 1 Keep that hot hard drive cool; it will last longer.
- 2 You can squeeze the most space from your drive by partitioning.
- 3 Run ScanDisk, Disk Defragmenter, and other maintenance utilities after you resize or move a partition.
- 4 Set your swap file as the first file on a second hard drive.
- 5 Advanced users only: set your swap file and vcache to fixed sizes.

Improve An Image

Tweaking Digital Cameras & Scanners

THE POPULARITY digital cameras and scanners enjoy today in terms of sales and home penetration wasn't always so. Only in recent years have these devices really solidified a comfortable place in the buying market. Part of the reason was cost. Early digital cameras and scanners were expensive and, typically, were not easy to use.

Operating a digital camera or scanner still isn't a matter of unpacking it and instantly using it, but manufacturers have consciously morphed their models into less intimidating and less costly creatures.

We've used hundreds of cameras and scanners and have seen many of these evolutions up close. Below are bits of wisdom we've gleaned over the years that might help you in your use. Some tips are common sense. Some we simply stumbled across,

as you are likely to do.

Camera Clues

Digital cameras can be difficult to operate, especially high-end models with manual options. Some models have an automatic mode for taking shots at default settings. However, most cameras need several seconds to compose a shot to automatically set the proper focus, saturation levels, white balance, exposure, and other settings. Typically, you must press down the shutter button halfway to tell the camera's sensor to compose a scene. A status light blinks while the camera makes adjustments. When the blinking stops, the camera's ready, and you can press the shutter button down fully.

Digital cameras capture images with an image sensor instead of film. This means a camera needs several recovery

seconds between shots to process and save an image. To shoot without delay, some digital cameras use built-in buffered memory to store images until they can be processed and saved. If you're taking action shots, make sure the camera has a burst or continuous shooting mode. We've found cameras with 16MB of buffered memory generally have good recovery times.

A selling point of digital cameras is their ability to transfer shots to PCs. Many cameras now use only a USB (Universal Serial Bus) connection to transfer shots. USB is faster and easier than serial cables, but if your PC doesn't have a USB port, you'll need a card reader that connects to a parallel port, or you might consider a different camera. Also, most cameras use removable memory cards to store images; SmartMedia and CompactFlash are the most common. However, some low-end cameras use only built-in memory. Some models use only integrated memory and only a USB connection, meaning you can't use a card reader, and your PC must have a USB port to transfer shots.

Most cameras can use common alkaline or rechargeable batteries. However, we've seen recent models from Fujifilm, Eastman Kodak, and Toshiba that use proprietary batteries; you won't be able to use just any brand or type. If you buy such a camera, buy spare batteries from the manufacturer up front; otherwise, you'll experience a lot of downtime waiting for your one set to recharge.

Pack an extra memory card and batteries. Nearly every digital camera we've used depletes battery power quickly. In addition, 4MB and 8MB memory cards fill up quickly if you're taking high-quality shots. Also, buy an A/C adapter if one isn't bundled. The first time you transfer shots without one, you'll see just how fast your batteries get zapped.

Keep the user manual close. We've used hundreds of cameras and still find features that are difficult to use. For example, we've used cameras that require as many as seven steps to delete just one shot.

Many cameras have a macro mode to focus on objects that are extremely close to the lens. Some cameras can focus an object as near as an inch. Using the LCD (liquid-crystal display) to frame shots is almost always better than using the optical viewfinder because the view you see through the viewfinder is slightly different than what the lens frames.

Lighting

Don't use a camera's LCD (liquid-crystal display) outdoors. Most LCDs we've used in direct sunlight are difficult, if not impossible, to see because they wash out. Imagine trying to watch television outside on a sunny day.

Different light affects images differently. For example, images taken at a camera's default settings under fluorescent light often produce a yellowish tint. Many cameras compensate for this by offering settings for fluorescent, tungsten, sunlight, and night shooting. If your camera has them, use them.

Some cameras have a lens unit that rotates as much as 270 degrees. These cameras are great for framing shots at nearly any angle, including capturing self-portraits. However, many models don't include an optical viewfinder; instead, the camera's LCD is used to frame shots; excessive use of the LCD exhausts battery power quickly.

Most cameras have zoom ability, but there are different types. Digital zoom uses embedded software to enlarge only a small portion of a shot. Optical zoom is preferable because the lens magnifies an entire image using multiple focal lengths. Zoom levels are measured with an "X," such as 2X. This means a lens can zoom an object two times beyond the minimum focal length.

Our Scanner Secrets

It's possible to buy a quality, mid-level scanner, stocked with versatile software, for around \$300, although models around \$150 can sufficiently scan documents and images for Web pages and e-mail.

Download the latest drivers for your scanner from the manufacturer's Web site. Drivers may have been updated between the time the scanner was released and you bought it. Current drivers contain fixes and computer instructions for optimal functionality.

Consumer scanners connect to PCs using one of three interfaces: parallel, USB, or SCSI (Small Computer System Interface). Parallel scanners are generally slower than USB models, which are usually easier to install. SCSI scanners are usually faster than USB but are more expensive and difficult to install. Typically, you'll need to open the PC's case and insert a SCSI card in a PCI (Peripheral Component Interconnect) slot. IEEE 1394 (FireWire) scanners are even faster, but they are generally geared toward professionals and are much more expensive.

When you upgrade to a new scanner, uninstall the drivers and software for the old model. We've found Windows isn't designed to have more than one scanner installed at a time. If the old software and drivers aren't uninstalled, your system may not know which application to default to. Older drivers take up resources. In our labs, we restart our test unit in DOS. At the prompt, we type `win d:m` and press `ENTER` to restart the system in Safe mode. We access Device Manager (double-click System in Control Panel) and remove the old scanner.

We've discovered manufacturers introduce a line of scanners with three or four different models that are nearly identical but priced differently. One

Digital Cameras

- 1 Pack extra batteries and removable memory.
- 2 Keep the user manual nearby.
- 3 Buy an A/C adapter if one isn't bundled.
- 4 Know the difference between optical and digital zooms.
- 5 Use the LCD to frame macro shots.

Scanner Hot Tips

- 1 Download the latest drivers.
- 2 Don't overspend.
- 3 Uninstall old software and drivers first.
- 4 Use film scanners to get the best results when scanning negatives.
- 5 Remember that true and interpolated resolutions are different.

may cost more because it has an automatic document feeder, or another may include Adobe Photoshop, which most entry-level users don't need. Don't pay more for a scanner with features you may not use.

If you'll be scanning negatives, the scanner should have at least 36-bit color and a resolution of 1,200 x 2,400dpi (dots per inch). The standard resolution measurement, dpi, is used for scanners and refers to the number of pixels (picture elements) in each square inch. A higher dpi usually means a better but slower scan. Bit color refers to the number of bits used to make up each pixel. For basic needs, a scanner with 600dpi and 36-bit color should be fine.

We open test scans in Photoshop 5.5. Photoshop functions fully at

36-bit color and can go up to 42-bit color, with some loss. We found even though a scanner has 42-bit capabilities, you'll only be able to send scans to other users if they have an application capable of 42-bit color.

A scanner may have an impressive resolution, but it may be interpolated (technology that duplicates or guesses where additional pixels should be placed in an image). As with digital cameras, an interpolated resolution is not the same as a true resolution.

Older scanners didn't scan black-and-white negatives well. We've seen improvements; some scanners bring out better gray tones in image reproductions. In our testing, a scanner that reads 27 shades of gray is average. **II**

by Blaine Flamig



Taking Control

Picking The Mouse Or Trackball That's Right For You & Making It Work

IMAGINE PERFORMING all your computing tasks without the benefit of a mouse or trackball, and you can begin to appreciate just how much computer users have come to rely on these small, ubiquitous pointing devices. To help you get the most from them, we've outlined a few things to keep in mind when choosing and caring for your mouse or trackball.

Before You Buy

Although many mice and trackballs come with both USB (Universal Serial Bus) and PS/2 connectors, some models come with just one or the other. Be sure you know which variety you need before you buy.

If desktop space is tight, keep in mind that trackballs remain stationary and don't require extra space for mousepads. Also, because trackballs let you move your Windows pointer with a finger or a thumb instead of an entire hand and arm, some users find trackballs less taxing for extended use.

For even greater comfort, consider an ergonomic mouse or trackball.

Ergonomic devices can help alleviate strain on tired, aching hand and wrist muscles. We would offer one caveat, however; some, like Logitech's MouseMan Wheel mice, fit comfortably into the palm of your right hand in its relaxed, slightly cupped state. This makes them great for most users but disqualifies them for use by left-handers.

Cordless mice can reduce the number of wires around your desktop. There are two categories of cordless mice: IR (infrared) and RF (radio frequency) devices. IR devices are often cheaper than their RF counterparts, but many of them require a clear line of sight to their receivers to function properly (like a TV remote control), unlike RF mice that can face away from their receivers and still work smoothly.

Performance

If you're having trouble with mouse or trackball accuracy, you may need to adjust its speed setting. In some cases you can do this using the software that came with your mouse. Otherwise, you can use the Mouse Properties dialog box in Windows' Control Panel. Click the Start button, point to Settings, and click Control Panel. Click the Mouse icon, then click either the Motion tab or the Pointer Options tab, adjust according to preference, and click OK.

Sometimes control problems are the result of sluggish, erratic pointer movement. This may mean that

your mouse or trackball is wearing out, or it might just mean a good cleaning is in order. Remove your device's ball (your user's manual may offer some help with this) and gently clean it and its cradle with a cotton swab and some rubbing alcohol or tap water.

While we're on the subject of dirt and particle buildup, one type of pointing device is immune to such problems. Optical mice and trackballs use solid-state electronic sensors instead of moving parts to move your pointer, so although they cost a bit more, they will most likely last longer.

Features & Settings

Left-handed users can set the buttons on most mice to perform the opposites of their usual functions. Open Windows' Control Panel, click the Mouse icon, and click the Buttons tab in the Mouse Properties dialog box. Click the Left-Handed radio button in the Button Configuration area and click OK. ■

by Lori Robison

1 Find out what kind(s) of device ports your computer has before you buy; some units come only with USB or PS/2 connectors and may require adapters to work with your PC.

2 Trackballs aren't for everyone, but because they remain stationary and don't require mousepads, they make good alternatives to mice if desktop space is scarce.

3 Some ergonomic mice and trackballs are molded specifically to fit users' right hands and won't work for left-handers.

4 You can make pinpointing objects with your pointer easier by adjusting its speed with the Mouse Properties dialog box in Windows' Control Panel.

5 Sluggish or erratic pointer movement could be a sign that your mouse or trackball needs cleaning.

EVER WISH YOU HAD SOMEONE LIKE HIM
AROUND WHENEVER YOU NEEDED HELP?



WISH GRANTED.



DID I MISS MY TURN? WAS THAT A PIECE OF METAL I JUST DROVE OVER? I CAN'T BELIEVE SOMEONE STOLE MY CAR. WHEN YOU FIND YOURSELF IN PERIL, JUST PRESS THE ONSTAR BUTTON IN YOUR CAR. STRANDED? WE'LL LOCATE YOU BY SATELLITE AND SEND FOR A TOW TRUCK. CAR STOLEN? WE'LL TRACK IT AND NOTIFY THE POLICE. LOST? WE'LL GUIDE YOU. IT'S LIKE HAVING YOUR OWN PERSONAL SUPERHERO. TO FIND OUT HOW TO GET ONSTAR ON YOUR NEXT VEHICLE, SEE YOUR CHEVROLET, PONTIAC, GMC, OLDSMOBILE, BUICK, CADILLAC* OR SAAB* DEALER, CALL 1-888-ONSTAR-7, OR VISIT WWW.ONSTAR.COM.



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Full Of Sound & Fury

Tips For Tuning Up
Your PC's Audio & Video

MOST PC COMPONENTS are of the "meat

and potatoes" variety. Processors process, hard drives store data, RAM chips remember things, and so on. They may fill your appetite for computing power, but PC audio and video is what feeds the soul of a computer user.

If you have the right audio and video hardware and it's set up correctly, you can indulge in DVD movies while being enveloped in Dolby Digital sound. You can play PC games on your TV and watch TV on your PC. You can even turn your PC into an MP3 jukebox or play the latest games in all their 3-D, eye-candy glory. Use these tips to stuff yourself at the buffet of multimedia indulgence.

Video Cards

I want my PC TV. Gamers and PC DVD drive owners take note: If you

have a video card with a TV-out jack, put it to work and plug your PC into your TV. You'll probably find playing games and watching DVD movies more enjoyable on your 27- or 35-inch TV than on a 17-inch monitor.

Also, if your video card has both an S-Video-out jack and a composite video-out jack, use the S-Video-out connection (assuming your TV has an S-Video-in jack) for a better quality video signal. Graphics cards with S-Video-out jacks include such offerings as Hercules' 3D Prophet II Pro GTS, and ATI Technologies' All-In-Wonder RADEON, which in our opinion is one of the most versatile video cards you can buy. It's great for playing DVD movies, capturing and editing video, and watching TV on your PC.

Memory and speed. Today's high-end video cards pack as much as

64MB of memory, or as much as some PCs (more in some cases). Unless you're a gamer, or you use sophisticated 3D CAD (computer-aided design) programs, chances are you won't ever require that much video memory, so save yourself a few dollars and buy a 32MB card instead. It should be more than enough for your computing needs.

Getting the right kind of memory can be as important as getting enough memory. When shopping for a graphics card, look for one that uses DDR SDRAM (double-data-rate synchronous dynamic RAM) rather than older SDRAM. Video cards that use the newer memory are faster because DDR SDRAM processes data on both the leading and falling edge of each clock cycle. In non-geek speak, this means that video cards with DDR SDRAM can calculate twice as many operations per clock cycle as those with SDRAM (this does not mean the graphics card will be twice as fast as a card that uses SDRAM, however).

If you have plenty of the right kind of memory and you still want more speed, there's one other thing to try. Some graphics cards include a utility you can use to increase the clock speed of your video card's graphics processor and memory, a process called overlocking. Overclocking will give your video card a performance boost, but use caution. If you overclock the graphics chip or memory too much, there's a chance it could cause some of your software to become unstable, and it may even damage your video card's components.

Getting the picture. Sometimes one monitor just isn't enough. If you have a graphics card with dual-monitor support, such as Matrox's G200 Multi-Monitor Series or Hercules' 3D Prophet II MX Dual-Display Video, you can connect more than one monitor to your PC. That way, you can surf the Web on one monitor while you work on a spreadsheet or database on another.

Your video card can also determine what kind of monitors you use. Digital

flat-panel monitors are cool, but you should make sure your graphics card supports them before you buy one. Some older graphics cards may not work with a digital flat-panel monitor, so be prepared to buy a new graphics card if you buy a new monitor.

Service after the sale. If you buy a new video (or sound) card, the first thing you should do after installing it is to check for a driver update. Manufacturers regularly add code to their driver software to make their products compatible with a wider variety of PC components and to improve general performance. Chances are one will be available in the technical support area of the manufacturer's Web site by the time you get your new card home. Visit the site as soon as you finish installing the card, then download and install the latest drivers.

It's a good idea to continue to check for driver updates on a regular basis, even if you are still using the original sound and video cards that came with your computer. If you are still using your computer's original sound card and video card, check your computer manufacturer's Web site for driver updates, not the manufacturer of the sound or video card.

Both video cards and sound cards use Microsoft's DirectX APIs (application program interfaces), so it's a good idea to make sure you have the latest versions installed. You can download DirectX at <http://www.microsoft.com/directx>.

3dfx users take note! In case you haven't heard, NVIDIA is buying 3dfx. However, NVIDIA will not be providing technical support for current 3dfx products. As of press

time, 3dfx informed us that it would continue to offer technical support for its current products through February 12th, 2001. The company hadn't yet decided whether it would continue to offer support beyond that date.

Sound

Shop smart. Before you buy a new sound card it's a good idea to consider how much sound card power you'll need. If you seldom use PC audio, a less expensive product should suffice, so skip all the bells and whistles. If, on the other hand, you frequently play games, watch DVD movies, listen to MP3 files, or edit your own music and sound, you will probably want a robust sound card.

You'll probably also want to learn more about Dolby Digital sound. If you play DVDs on your PC and you want to listen to them in Dolby Digital sound, you'll need a Dolby Digital decoder. Some 5.1 speaker systems include a decoder as part of the package; otherwise, you'll have to buy a sound card with Dolby Digital support built-in.

Auditory feng shui. 3-D sound technology is improving, but it still has room to grow. If you want to maximize your 3-D audio experience (especially for games), you should use four speakers—two in front, and two behind you at about ear level. This is important, because most 3-D audio technologies divide the audio signal into front and rear channels. Some sounds will come from the rear speakers only to simulate sounds that are coming from behind you.

Subwoofers also add extreme depth to high-end PC sound, but proper placement is critical. Place your PC's subwoofer directly against a wall (preferably in the corner of the room) to achieve best sound quality. You don't have to point a subwoofer, though, because the low-frequency

sounds it emits are non-directional; it'll sound the same no matter which way it faces.

ATI's All-In-Wonder RADEON does a little bit of everything, from powering 3-D games to capturing video.



Hot Tips

1 If you buy a new video card or sound card, the first thing you should do after installing it is to check the manufacturer's Web site for a driver update.

2 You should check for driver updates for your sound card and video card on a regular basis, even if you are still using the original sound and video cards that came with your computer.

3 Both video cards and sound cards use DirectX drivers, so it's a good idea to visit Microsoft's DirectX Web site occasionally and make sure you have the latest version.

4 Position rear PC speakers at or near ear level several feet behind you for best results. One common method of setting up rear speakers is to affix them to the wall at your back.

5 If your CD-ROM or CD-RW drive has a digital audio-out jack and your sound card has a digital input jack for optical drives, use the digital connection for better audio quality.

The importance of rear speakers and subwoofers notwithstanding, the center channel is the key ingredient to a good 5.1 Dolby Digital setup. If your PC speaker system includes a center channel speaker, it's best to place it on top of or right next to your computer's monitor. Correct placement of the center channel speaker is important because it plays more of the dialog and sounds you'll hear than any other single speaker.

Bells and whistles. If your CD-ROM or CD-RW (CD-rewriteable) drive has a digital audio-out jack and your sound card has a digital input jack for optical drives, take advantage of this digital connection. The audio quality you'll get when you play CDs or MP3 files will be much better than that of the typical analog connection most users have between their optical drive and sound card. You'll probably have to buy a digital cable to connect the two, but they're usually pretty cheap. **II**

by Michael Sweet

Clearing Up The Bit Mystery

When Bits Make Bytes & More PC Math

Few TERMS ARE AS CONFUSING, or misleading, as bits. Monitors, processors, scanners, video cards, OSes (operating systems), and other PC hardware and software have "bit" in their specifications, but the specifications rarely mean the same thing. Some components have multiple bit ratings, but manufacturers generally advertise only the highest. Understanding what bits are and how they relate to components is vital if you want to understand the capabilities of the hardware and software you're buying.

Bit is an acronym for binary digit. Binary is the numerical tongue PCs speak; everything is represented by a series of ones and zeros. Those numbers are bits, and obviously each bit can have one of two values: one or zero.

Technically the ones and zeros are conventions programmers use to represent bits. A bit's value has no inherent value. You may have heard that one means "on" and zero means "off," or that one means "true" and zero means "false," but the values represent anything a programmer assigns to them.

The binary system expresses everything in powers of two. Small increases in bit ratings represent tremendous increases in the number of associated values. A 1-bit system expresses two values (2^1); it's like a photocopier that prints only solid black or white with no shades of gray. Moving to 8-bits (2^8) makes 256 unique values possible. An 8-bit copier reproduces 256 shades of gray (including solid black and pure white). Doubling that to 16-bits yields 65,536 usable values. You get more than 16.7 million discrete values at 32-bits and nearly 4.2 billion at 64-bits. That means a single math calculation performed on a pure 64-bit computer using a 64-bit application could incorporate billions of variables and be accurate to billions of decimal places.

Bits are strung together to form larger data structures, much as atoms together form molecules. Those data "molecules" can also be combined to create complex strings. An 8-bit string forms a **binary term** (byte), which generally is the smallest unit of data a computer can make

sense of. A keyboard character, such as the lowercase "a," requires one byte of storage space.

Data

Bits represent data and often express storage capacity, data throughput, or another measures of raw data performance. Expressing a product's capacity and speeds using bits instead of bytes leads to artificially inflated numbers that confuse novices. Look at console video games: Nintendo lists the data capacity of its game cartridges in megabits instead of megabytes. Saying a game needs 64Mb of storage sounds more impressive than 8MB, especially when competing console makers use CD-ROMs with storage ranging from 650MB to more than 1GB.

PCs are no clearer. Dial-up modem speeds are measured in kilobits per second (Kbps) instead of kilobytes per second (KBps), but file downloads are listed in kilobytes or megabytes. Even with broadband, such as DSL (Digital Subscriber Line) and cable modems, data transfer rates are advertised in kilobits and megabits. Uninformed users will pay to download data at 600Mbps rather than 75Kbps, although the values are the same.

The data throughput of most PC peripherals are expressed in megabits per second. USB (Universal Serial Bus) connections, for example, can transfer data at a theoretical maximum speed of 12Mbps. FireWire is always advertised with a data throughput rate of 400Mbps, and printer and serial port throughput rates are listed in kilobits per second. All this despite the fact that the data is almost universally measured in kilobytes, megabytes, and gigabytes.



Whether cutting through hype or translating numbers into meaningful terms, converting from kilobits or megabits to kilobytes or megabytes is easy. The calculation varies slightly depending on whether you're talking about storage capacities or data transfer rates. For storage, it takes 1,024Kb to equal 1Mb, or 1,024KB for 1MB. For data transfer rates, such as modem speeds, there are 1,000Kb in 1Mb, and 1,000KB in 1MB.

Because there are eight bits in a byte, dividing bits by eight and carrying over the "kilo" or "mega" prefix gives you the value in bytes. USB's 12Mbps transfer rate means it can transfer up to 1.5MBps. The 400Mbps limit of the IEEE 1394 (FireWire) standard translates to a whopping 50MB per second. A 56.6Kbps modem could theoretically allow for data downloads at just over 7KBps, meaning you could download 1MB of data in around 2.5 minutes.

Converting from megabits to kilobits works the same way as converting kilobits to kilobytes. For storage values, multiply the megabit by 1,024 to convert to kilobits. If you are talking about transfer rates, multiply the megabit value by 1,000 to get the kilobit value.

Processors & Other Hardware

The components at the heart of your PC, such as the CPU and system buses, have bit ratings. CPUs are the most confusing bit ratings because several ratings may be associated with them.

In a 32-bit processor, the bit rating usually refers to the number of bits the processor crunches simultaneously, the amount of system memory it can handle, and the precision of its output. Don't take a processor's advertised bit rating at face value. Sometimes a 64-bit processor bites off 64 bits at a time but processes half of that in the same time frame. Other times it processes 64-bits at a time internally but outputs data in 32-bit chunks. In a true 32-bit or 64-bit environment, all input, processing, and output happens at the advertised rating.

Another benefit high bit-ratings bring is the ability to use larger amounts of memory. A 32-bit PC addresses a maximum of 4GB of memory, which seems like enough, but it won't meet the needs of large businesses in the next few years. A 64-bit processor addresses up to 18 billion gigabytes of RAM, which gives any business plenty of headroom. With a 64-bit processor, you can create enormous databases, graphics archives, and other abnormally large files that memory can access,

greatly speeding performance. The 64-bit processor's ability to read so many bits at a time will also make accessing and editing these large files much faster.

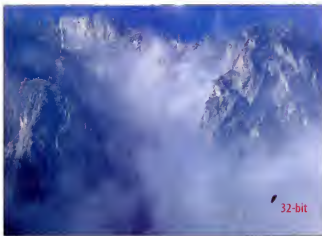
For internal interfaces, bit ratings are the number of bits the bus transmits simultaneously. A 32-bit bus sends a maximum of 32-bits at once, which is more efficient than sending a continuous stream of 32 bits one at a time.

Operating Systems & Software

The 64-bit processors that are poised to eventually replace today's 32-bit models would be worthless without 64-bit OSes to take advantage of their advanced features. Upcoming 64-bit OSes will be able to process more information faster, and their ability to address enormous amounts of memory should make them more stable and better able to let users work with gigantic files.

Today's 32-bit Windows OSes can run older 16-bit Windows and 8-bit DOS applications, but the 64-bit OSes of the future may not have the same level of backwards-compatibility. Most businesses hate upgrading their old applications, but a 64-bit OS may be streamlined to run only 64-bit software. Always check before upgrading to make certain your old programs will still run properly on the new hardware and OS.

These images of smoke and mist have millions of unique shades of color and suffer from color reduction. The 32-bit image has perfect transition from one color to the next. Stepping down to 8-bit leaves patches of same-colored pixels, with only 256 shades to work with. The 4-bit, 16-color image is much worse. The 8-bit grayscale image yields detail comparable to the 32-bit color.



32-bit



8-bit

Graphics

In some applications, bits advertise the hardware or software's accuracy.

Scanner manufacturers, for example, throw around numbers, such as 36-bit or 42-bit color. Because 32 bits can represent nearly 4.2 billion distinct values, a 32-bit scanner should capture and reproduce that many colors.

A scanner's bit rating tells only part of the story. The scanner combines three scans (one each for red, green, and blue values) into the final picture, and each gets an equal slice of the total bit rating. A 24-bit scanner captures 8-bits reds, 8-bits greens, and 8-bits blues for 256 shades of each color. As more bits are allocated to each color, the output steadily gets more accurate.

The color depth a graphics card outputs is expressed in bits, and video cards capable of 3-D acceleration have two bit-depth ratings: one for 2-D output, such as your Desktop, and one for 3-D applications. Most video cards today can render 32-bit color, meaning any given on-screen pixel (picture element) can theoretically display one of almost 4.2-billion distinct shades. Because of its fidelity, 32-bit color is also referred to as True Color.

Older notebook displays are capable of only 16-bit color, or 65,536 simultaneous colors, which is a far cry from the quality of a 32-bit display. A better compromise is a 24-bit display, which shows more than 16 million colors.

Don't forget 3-D specifications. Nearly all video cards today can display stunning 2-D images in 32-bit color, but some top out at 16-bit color for 3-D output. Not long ago 16-bit and 32-bit

games looked nearly identical. Now, artists are taking advantage of the 32-bit capabilities of today's 3-D games. Cards you buy with gaming in mind should support that color depth for 3-D.

Video cards and monitors let you select bit-depth. You can adjust your video card to any bit depth it supports as long as your monitor can handle it. What you sacrifice in color accuracy is compensated for by an increase in performance; high bit-depths require copious amounts of video memory and video processing horsepower. Dropping from 32-bit color to 16-bit color in PC games yields tremendous performance gains and may help even more than lowering the game's resolution.

Audio

Some audio specifications are measured in bits. CD-ROM and DVD-ROM drives have DACs (digital-to-analog converters), which translate the digital signal they read from the CD into an analog signal for your speakers. DACs with high bit ratings keep the signal more pure during the translation.

Sound cards have many associated bit ratings so look at the specifications carefully. For example, Creative Technology's SoundBlaster Live! series has digital input and output hardware that converts digital music to analog signals at up to 20-bit accuracy, but that hardware isn't used for all applications. Most sounds in games, for example, are translated with 16-bit fidelity. The

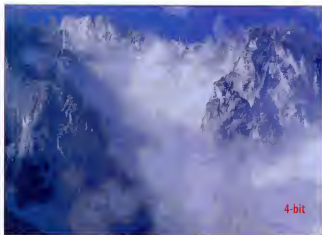
SoundBlaster cards have a 32-bit processor, but don't confuse it with the 20-bit DAC. Check a company's Web site or the actual product manual for detailed specifications.

Buyer Beware

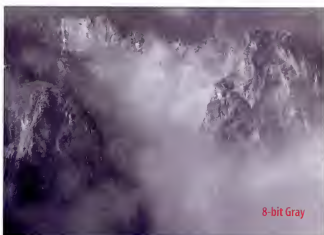
There are simple ways consumers can protect themselves from misleading or incomplete bit-related information. Check data throughput rates and storage specifications closely to see if the numbers are tagged with an uppercase or lowercase "b." As stated above, the former indicates bytes, kilobytes, or megabytes, and the latter indicates bits, kilobits, or megabits. And there's more. Sometimes manufacturers, Web sites, and magazine reviews say megabytes when they mean megabits. If a specification looks odd, verify it with other sources. Ask detailed questions about products before you buy. If a salesperson says, "This video card uses a 128-bit processor," ask him specifically how that will benefit you. Chances are he doesn't know what he's talking about.

Don't be too quick to buy a product just because it has a higher bit rating than the one you have. Ironically, 64-bit processors run 32-bit software more slowly than comparably equipped 32-bit PCs. If a product won't work well with the hardware and software you already have, don't upgrade. ■

by Tracy Baker



4-bit



8-bit Gray

Force Feedback's Realistic Recoil

BACK WHEN THROGS CROWDED around flickering monochrome screens to play Pong, computer games were an oddity that kept players amused for hours. Today, computer games are commonplace and even casual players expect a great deal when they buy the latest flight simulator, for instance. They want to feel the action and immerse themselves in the game, something scarcely imagined when the first game console, joysticks, and video arcades appeared.

That's why force feedback, the ability of a game controller to physically respond to on-screen action, is becoming more popular. When combined with sound and high-quality graphics, the force lets users feel, as well as see, the action. Driving wheels jerk and veer as you crash into a barricade, joysticks recoil after you fire a virtual machine gun, and controls become sluggish as you struggle over a hill or battle gravity or wind. Video arcades have motorcycle games

that feature tilting, including sliding seats that move as you steer through an off-road course, and downhill skiing games that let you experience the slalom.

The game software and the controller must be force-feedback compatible, of course. These controllers tend to be bulkier and more expensive than regular controllers because of the motors. However, the process for enabling force-feedback response is not as complicated as you may think.



1 In a game that supports force feedback, such as Microsoft's *Crimson Skies*, you may fire a machine gun that has an associated force-feedback response built into the game's code. The game signals the microprocessor in the force feedback controller.

2 The signal prompts the microprocessor to select one or more waveforms, which in custom force feedback is stored in the game software, but otherwise is in the chip's RAM. Pulses of electricity that vary in duration and intensity create the waveforms, each representing a force feedback movement. Waveforms with sharp peaks and valleys, for example, represent the short, jerking movements you feel when you fire a virtual machine gun; smooth, curving waveforms represent resistance to gravity.

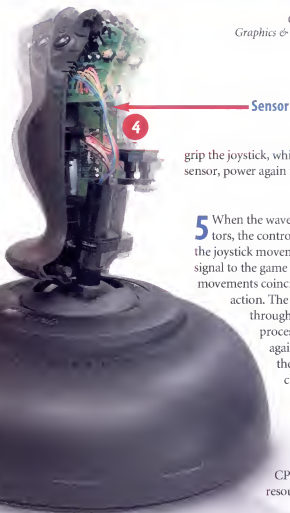
3 Once the controller's chip selects the proper waveform, it sends the pulses to the motors.

The pulses cause the joystick to move, shake, or vibrate. For instance, if you're playing a flight sim with Microsoft's *SideWinder Force Feedback Pro* joystick, it shakes when you fire your guns, jolts when you get hit by gunfire or anti-aircraft flak, and rumbles when you take off, among other responses. Some force-feedback joysticks,

Compiled by Lori Robison
Graphics & Design by Andria Schultz
Layout by Jason Hardy

such as the SideWinder, have two motors: one for y-axis (vertical axis, which controls up and down movement) force feedback response and one for x-axis (horizontal axis, which controls side-to-side movement) response. Wheels typically have one motor, use only the x-axis, and vibrate in response to action. Most force feedback controllers have a power pack that you'll need to plug into an outlet.

4 The SideWinder Force Feedback Pro has an infrared sensor that shuts off power to the motors when you release your grip so the stick doesn't move unintentionally. When you



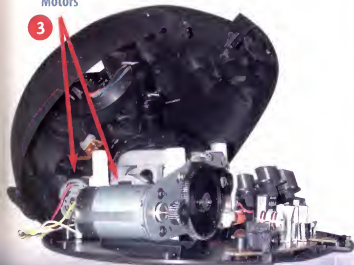
grip the joystick, which blocks the infrared sensor, power again flows to the motors.

5 When the waveform reaches the motors, the controller's processor notes the joystick movement and routes a signal to the game so the controller's movements coincide with the onscreen action. The entire process through the software, microprocessor, motor, and back again is instantaneous to the user. The controller's chip speeds up the process because it routes data between the game and controller, rather than through your PC's CPU where other system resources and tasks slow down the signal.

Left View

Motors

3

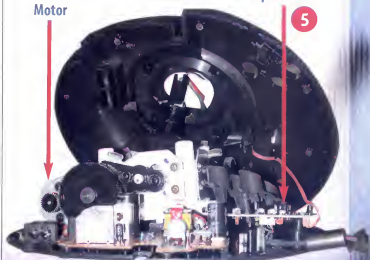


Front View

Motor

Microprocessor

5



Preview Of Microsoft Office 2001

Shared Features & Speech Recognition Lead The Way



IN CASE YOU HAVEN'T HEARD, Microsoft is developing another version of Office (code name Office 10), due to be released sometime in 2001. You may be wondering if features in this latest version may compel you to buy it. We'll take you on a quick run-through of the features that span all programs and show you key enhancements for each of the four main programs Office includes: Word, PowerPoint, Excel, and Access. We'll also warn you about some of the pitfalls that we encountered as we worked with the beta software.

At the time of this writing, we had tested the Beta 2 release of Microsoft Office 10. The beta fixed some of the

glitches that plagued the first beta release. Specifically, Outlook continues to be problematic. We installed the program but had to completely uninstall it. By the time Microsoft releases the final version, we expect it will fix the problems with Outlook so that even the faint of heart won't mind firing it up. The other programs in the suite worked reasonably well, and we presume that Microsoft will fix the rough spots before it releases the final version.

Features For All

As you'd expect from a suite, Office 10 includes features that span all the

programs. What you'll probably notice immediately is a new look: a flatter interface. Among the biggest changes in Office 10's interface, however, are the task panes, which display on the side of the application window and include relevant hyperlinks for whatever command you're using. For example, PowerPoint includes a task pane you can use to quickly access different slide templates, and Word has a Mail Merge task pane. Some of these task panes automatically display when you access the associated command, but you can also manually open the most recently used pane by choosing View, Task Pane.

While many of the task panes are custom-designed for the individual programs, a variation of the File New task pane (displayed when you choose File, New in any application) is present in all of the Office applications. You can use this pane to quickly open and create documents and templates. For example, PowerPoint's task pane offers options to create a new presentation from a template, with content, or completely from scratch.

Another feature that spans all programs is the Office Clipboard. This specialized clipboard can collect items from a variety of sources, and then paste them individually or all at once in other programs. For example, you can use Copy to collect a Word logo, an Excel chart, and a clip from the Web and paste them simultaneously into a PowerPoint presentation. Although Office 2000 included this feature, Office 10 increases the number of items you can collect from 12 to 24. Additionally, you can display the Office Clipboard in its own task pane by clicking Edit, Clipboard. This lets you see pictorial icons that show what you're actually pasting, unlike the previous version's Office Clipboard, in which pasting was a shot in the dark at best.

Your word is my command. One of Microsoft's biggest selling points for Office 10 is its Speech Recognition technology. Here's the idea behind the feature: You speak the names of toolbar buttons, menu items, and dialog box controls, and the software responds

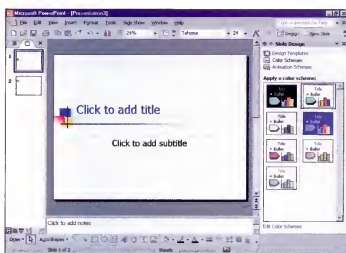
appropriately. Sort of. In the beta version we tested, the Speech Recognition feature wasn't fully operational. In theory, however, it will respond to your every command. The first time you use the feature, Office helpfully walks you through installation of the speech software (and the Training Wizard) so that the feature is set up optimally. After the initial setup, you should be ready to communicate hands-free with your computer.

Quick fix. AutoCorrect, is the feature that automatically replaces misspelled words and typos with the correct version. If you're like most people, however, you either love it or hate it; sometimes, when you type c), you don't want Word to assume that it should be displayed as a copyright symbol. To put control back in your hands, the AutoCorrect Options button displays when Office programs perform automatic spelling or formatting so that you can pick options from the button's drop-down list.

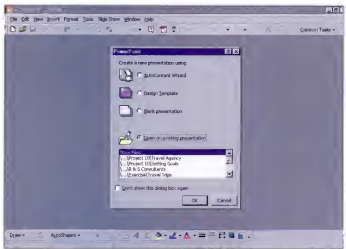
Paste Options. If you've ever pasted table text from Word into an Excel worksheet or tried to export a PowerPoint presentation to Word, you know the formatting in the destination document doesn't always match that in the source document. To help maintain consistent formatting (especially when you're pulling information from several sources), Office 10 displays a Paste Options button when you paste data from one program into another. To use the button, click the drop-down list arrow and pick from options, such as Keep Source Formatting or Match Destination Formatting.

Office Assistant. In Office 2000, the Office Assistant appeared when it "thought" you needed help. Although

some users welcomed the Office Assistant's arrival, others found its frequent appearance annoying. If you're in the latter group, you'll be happy to know that Clippit no longer appears when an Office program fires up; by default, it stays hidden until summoned.



The new task pane (above) is an improvement over the New dialog box.



Another improvement to the Help system is an on-screen box that you can use to quickly tap into Help's resources. This box, called Ask A Question, appears on the menu bar of each Office application. To use it, type a few keywords and press ENTER.

Search. If you've worked with Office programs for very long, you've probably come to rely on the Find feature to help you locate data within your documents. To use the augmented version, click the Search button on the Standard toolbar to display the Basic Search task

pane. Type the text in the Search Text box and specify the options you want to use for your search, such as looking only in your document for the information, looking anywhere on your computer, or even looking on networked computers, and then click Search.

Surviving a crash. Freezing, crashing, and hanging up are sometimes the inevitable consequences of working on a computer. Knowing that hardly makes it easier to take. To reduce your pain and suffering, Microsoft has built improved reliability features into Office 10 so that you won't lose work every time your computer goes south.

The most noteworthy new feature, included in Word, Excel and PowerPoint, is the Save On Crash feature. This feature prevents you from losing work if an application fault causes the program to fail. Here's how it works: When you restart the program after a crash, the documents you were working on display in a special Document Recovery task pane. Just click the documents that you want to reopen (or save) to get back on track.

Besides recovering documents in case of a crash, you can also salvage corrupted documents. To repair corrupted documents, click File and Open to display the File Open dialog box and click Open And Repair from the drop-down list arrow.

Now that you have an idea of the new features that span all Office programs, let's take a look at new features in individual programs.

Word

Most of Word's new features are not truly new, but rather marked improvements on features in previous

versions. Many enhancements fall in the ease-of-use category. For example, if you've ever gotten lost while working through Word's Mail Merge feature, you'll probably appreciate the new Mail Merge Wizard, which displays in a task pane.

Another improved Word feature lets two users edit a document at (almost) the same time. It appears as though both users are working simultaneously on the document, but Word is actually making copies for each user to edit and merging the copies together. The Track Changes (click Tools, Track Changes) feature is also more robust and less obtrusive than in previous versions.

Another ease-of-use feature helps you select multiple areas of a Word document at once. Press CTRL while dragging over the areas, and you can then Cut, Copy, Format, and even Search the selected areas.

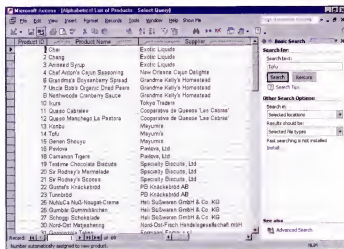
Word has improved numbered and bulleted lists and tables. You can copy a table using the drag-and-drop method; use custom table styles; and sort by more than one item, such as both the first and last names, in a column. Finally, any new text you add to a table uses existing styles.

Improved Format. Word includes numerous improvements to its formatting features. For example, remember WordPerfect's Reveal Codes, which gave you a look behind the scenes to the actual format code of the document? Word 10 reinvented this concept with its Reveal Formatting. Click Format and Reveal Formatting to display the Reveal Formatting task pane and click in your document. The font, paragraph, spacing, image, and table properties show in the task pane.

Another handy task pane in Word is the Styles And Formatting task pane (activated by clicking Format, Styles And Formatting), which lets you reuse

formatting in a document. Furthermore, if you want to get rid of formatting completely for a selection, you can do it quickly with the Clear Formatting tool.

The new Format Checker helps to ensure you have consistent format throughout a document. Check for consistent format as you type or after



Use the Search pane to find information from almost anywhere.

you're finished. Word flags improperly formatted words by underlining them with blue (similar to how it marks misspelled words). Right-click the word to see formatting options.

Additionally, Microsoft bolstered other proofing and editing tools. AutoComplete includes helper text that walks users through using the feature, and a Word Count toolbar continually tracks word count, a feature writers and students will embrace.

Other Word improvements relate to drawing within the program. The Drawing Canvas holds drawings in a static position and helps eliminate Word's formerly bizarre behavior that sometimes occurred when drawings bumped into page breaks or text. Finally, you can create watermarks for a logo or picture without having to undertake a lot of intricate steps.

Excel

The main reason you probably use Excel is to accurately crunch numbers

and analyze data. To help further these ends, Excel 10 includes a number of improvements.

First, you can get help as you build formulas with Excel's Argument ToolTips, which display when you enter a function. Here's how they work: Type the beginning part of the function, such as the equal sign, function name, and left parenthesis: =SUM(. An Argument ToolTip displays the arguments necessary to complete the function.

You can also rest the mouse pointer over an argument in the ToolTip until it displays as a hyperlink and click it to display helpful hints.

One of the easiest ways to analyze existing formulas for accuracy is to use Excel 10's Error Checking feature. Click Tools and Error Checking. Excel alerts you to problems with your formulas and gives you a chance to fix them in the Error Checking dialog box.

Another way to evaluate formulas is to turn on the Formula Auditing Mode. To do this, click Tools, expand Formula Auditing, and click Formula Auditing Mode to display color-coded formulas on your worksheet. The color-coding corresponds to the cell references used for the formula, which helps you determine what cells are used for the formula. You can systematically evaluate a formula by clicking Tools, expanding Formula Auditing, and clicking Evaluate Formula. In the Evaluate Formula dialog box, you can analyze or step through a formula and see the results. Of course, Excel also includes buttons for its auditing features on the Formula Auditing toolbar, which you display by clicking View, expanding Toolbars, and clicking Formula Auditing.

Another way Excel helps you enter everyday formulas more seamlessly is with the new and improved AutoSum button. Instead of simply adding up a

column or row of values, you can click the AutoSum's drop-down list arrow and select a commonly used function, such as Average, Max, or Min.

Web integration. Another area in which Excel has made strides is Web integration. Tight dovetailing between Excel and the Web helps you find, analyze, and publish up-to-date data, such as stock prices or currency quotations. Although Web-integration features aren't actually new, some of the enhancements associated with them are. For example, you can bring live information into Excel from the Web, and you can use the Auto-Republish feature to keep Excel data that you post on the Web in step with any changes you make to the underlying worksheet. To use this option, click File, Save As Web Page, and Publish. In the Publish As Web Page dialog box, choose Auto-Republish Every Time This Workbook Is Saved.

Finishing touches. Excel also includes a smattering of minor upgrades to its features. For example, you can sort lists by more data types than you were able to in previous versions. Other improvements to Excel are more window dressing than anything else. For example, you can color the worksheet tabs and include graphics in the headers or footers. You can also tap into new numerical formats.

Finally, you can use Excel's new Smart Tags. You can use this feature in Excel (and Word), to recognize various types of data and then assign actions to them.

PowerPoint

Microsoft gave PowerPoint, always the most graphical program in the suite, an interface facelift. For example, the program now includes task panes that help you visualize what you're doing as you create your presentation.

Each time you insert a new slide, the Slide Layout task pane displays so that you can choose from various text and content slide layouts; the Slide Design task pane (displayed by clicking the Design button) includes options for applying slide designs, color schemes, and animations to the presentation. Normal view, which PowerPoint piloted in Office 2000, has been revamped, with the Outline and Slides on separate tabbed sheets, instead of in separate panes. This lets you view thumbnails or an outline of the presentation at the same time as you view an entire slide.

Besides the modifications to its interface, PowerPoint 10 embraces three major changes. First, it includes a number of new animation schemes, categorized (as Subtle, Moderate and Exciting) so that you can more accurately choose the appropriate animation type. To apply an animation to the current slide, display the Slide Design task pane and click the Animation Schemes

the reviewer, and they are placed so that they don't cover up important information and can easily be printed.

PowerPoint's third major change is in the area of organization charts. You can develop organization charts using drawing tools within PowerPoint instead of using the Org Chart program. Additionally, PowerPoint 10 includes new predesigned diagrams, such as cycle and pyramid.

Access

Improvements to Access include ease-of-use features, as well as underlying robustness that database developers will appreciate. Like the other Office apps, Access includes data recovery features so that you can more easily bring back damaged forms and reports. This doesn't mean that you'll be able to patch up all problems, just that they're fixed a larger percentage of the time.

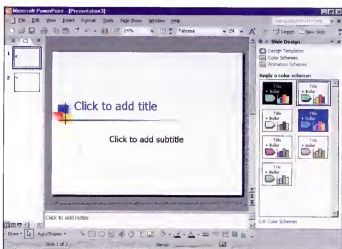
Additionally, if you've ever been

jarred by the absence of multiple Undo/Redo actions in certain Access views, you'll be happy to know that you can now undo several actions (or redo them). Access also includes several new shortcut keys that you can use to work effectively in the program. For example, when you are using the form or report Design View, you can press F7 to display the Code window and press F4 to display the associated property sheet. Finally, Access includes features that developers

will like, including new events and properties for forms and reports and an expanded Toolbox.

So, take a look at some of the major features in Microsoft's newest upgrade to its Office suite, and you'll be ready to decide whether to plunk down your money for Office 10. ■

by Linda Bird

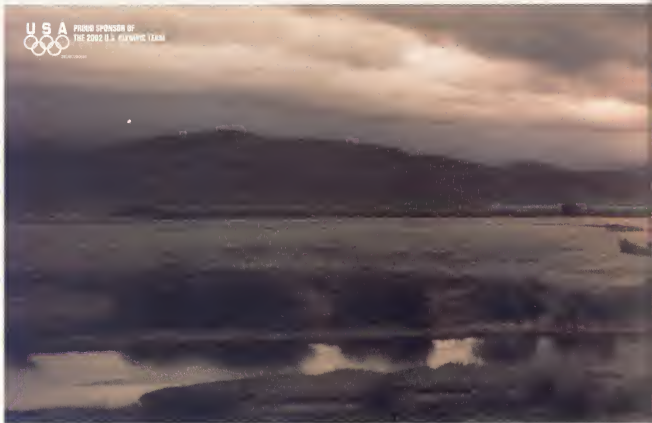


Icons in the task panes help you develop your presentation in a flash.

hyperlink. Choose an animation from the displayed list. You can even preview it by clicking Play.

Another key feature in the new version of PowerPoint is the ability to collaborate with others on a presentation and seamlessly blend their changes into one final version. Additionally, PowerPoint's comments are color-coded so that you can easily identify

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YOU MIGHT AS WELL BE A MICROSCOPIC



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TAHOE



LIKE A ROCK

Do Not Go Blindly Into The Notebook Store

Know Your Spindles From Your Bays Before Buying

FOR MANY OF US, few things are more confusing than buying a computer. It's a major purchase, and there's a lot to consider: CPU speed and type, memory, hard drive space, monitor size, tower vs. desktop, CD-ROM and DVD-ROM drives, bundled software, modem, speakers, and more. The list is almost endless, with a bewildering assortment of alternatives to ponder for each and every item on the list.

Tame The Notebook Jungle

And if you're thinking about buying a notebook PC, then you have all of those decisions to worry about, plus a whole batch of options peculiar to buying a portable computer. It sounds daunting, but we'll help you find your way through the notebook jungle.

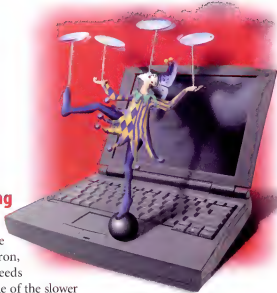
The CPU. It's going to come down to a choice between power and price; buy the most power that you can reasonably afford. Scrimping on the basics, especially on CPU speed and power, is false economy. Although you can usually add more memory and hard drive space later, there's normally not much you can do about an underpowered CPU.

What are your CPU choices? At press time, the Pentium III chip is about the most powerful one you'll find in a notebook, and you can find versions of it running at 700MHz or faster. With the Pentium 4 on its way, though, some experts are recommending that you wait. Once the P4 is released, prices on PIII-equipped computers (of all types) should plummet.

On the low end of the scale, consider the Celeron, which runs at clock speeds approaching that of some of the slower PIIIs. You can find a Celeron-equipped notebook running at 600MHz for several hundred dollars less than you'd spend on a similar PIII machine. While not as powerful as some of the PIIIs, the Celeron still packs more than enough punch for students and most small business applications, and it will handle typical Web surfing and e-mail chores with ease. Serious power users (graphic artists, video editors, programmers, heavy-duty gamers, etc.) might find that the Celeron gets bogged down a bit too easily for their taste.

Memory. Memory is pretty cheap, although the market for it can be volatile. Buy as much of it as you can manage. Don't rely on the manufacturer's promise that an operating system will run fine with 32MB. (It may until you try to run an application or two.) You need at least 64MB and 128MB is even better. Again, it's usually possible to add more memory later, so if it comes down to a choice, spend the extra money on CPU speed now and buy additional memory when you can afford it.

Hard drive space. Hard drive space is relatively inexpensive these days. You can expect to pay \$350 or less for a 10GB to 12GB drive for a desktop PC. Hard drives for notebooks are considerably more expensive, but even a reasonably priced notebook, say \$1,250 to \$1,350, should include a 5GB to 10GB drive. In any case, don't settle for less



than 5GB. Applications are much larger these days than they used to be, so you need that digital real estate.

Modem. If you're sending e-mail or surfing the Internet (or would like to be), you need a modem. While almost all notebooks these days come with an internal 56Kbps (kilobits per second) modem as part of the package, in a pinch you can use an external or PCMCIA (Personal Computer Memory Card International Association) slot modem (See below).

Network card. For about \$100 you should be able to include an NIC (network interface card) as part of your notebook package. Don't intend to network your computer? Then you don't need one, unless you expect to use a DSL (Digital Subscriber Line) for Internet and e-mail access. DSL requires a network card. If your notebook doesn't come with one, you can usually add a PCMCIA card later for about the same amount. Most notebook computers include slots for two PCMCIA cards. PCMCIA provides a handy way to add card-based peripherals, such as a modem or NIC, to a notebook.

Speakers and microphone. Unlike desktop PCs, most notebooks have a microphone jack and speakers built in. Unless you intend to use your notebook as a stereo (a perfectly reasonable thing to do, by the way), you probably don't

need to purchase separate speakers. If you want better sound, you can pick up a decent set of powered speakers for \$20 to \$50; they'll plug right into the side of your notebook.

CD-ROM, CD-RW (CD-rewriteable), or DVD-ROM (digital versatile disc-ROM) drives. Just about all software you'll find these days comes on a CD-ROM, and you need at least a 24X CD-ROM drive to take advantage of it. If you intend to create music or data CDs fairly regularly, you will need a CD-RW drive, which tends to run a bit more slowly than the 24X CD-ROM drive. They cost a bit more, too, so figure on adding \$250 to \$350 to the cost of your notebook.

A DVD-ROM drive also costs more than a typical CD-ROM drive, so figure on bumping up the cost around \$150 to \$200 if you'd like one of those. Do you need a DVD-ROM on your notebook? Probably not. The much-anticipated flood of DVD-based software has not yet materialized and probably won't for another year.

Your notebook's monitor. Notebook monitors have come a long way in the past few years. The difficult-to-read monochrome monitor viewable from only one angle is a thing of the past. You can still find inexpensive notebooks using passive-matrix displays, but they're rapidly being replaced with notebooks that use active-matrix displays (sometimes referred to as TFT, or thin film transistor). TFT monitors use a tiny transistor at each pixel, which enables each pixel to be turned on and off more quickly than with a passive-matrix display; the result is a sharper image, and one that refreshes quickly enough so that the cursor need not disappear when you move your mouse. Stick with a TFT display, if at all possible.



The 15-inch thin film transistor display on the Sony VAIO is sharp and easy on the eyes.

Don't settle for anything less than a 15-inch monitor, even on the less expensive models. If you're going to use your notebook computer for a few hours at a stretch, you owe it to your eyes to get a decent-sized monitor. (Most notebooks let you connect an external monitor so you may wish to hook up a regular monitor to your notebook and use it that way. Just remember that connecting your old monitor to a nice new notebook won't improve the monitor's performance.)

Battery power. You have essentially three choices when it comes to batteries. The nickel-cadmium is the old standby, being the original type of rechargeable battery. The nickel-cadmium battery is subject to "memory" problems; that is, it tends to "remember" the power level it held when it was most recently charged and cannot be charged past that point. Naturally, that eventually leads to a situation in which the battery holds less and less of a charge, eventually becoming useless. This is why nickel-cadmium battery users are admonished to drain their batteries completely before recharging.

The two newer battery types hold a charge more reliably and are not subject to the memory problem. The NiMH (nickel-metal hydride) battery and Li-Ion (lithium ion batteries) also last longer, and their charge lasts longer, too. When you have a choice, go with the (somewhat more expensive) NiMH or Li-Ion battery.

If your notebook comes with a nickel-cadmium battery, you can al-

most always purchase a Li-Ion (or, slightly less commonly, an NiMH) battery a little later.

Bays, spindles, and other such creatures. A notebook computer is, by definition, a relatively small piece of equipment. There's simply not enough room for a diskette drive, a hard drive, a CD-ROM, a DVD-ROM, and a Zip drive to all fit on or in the machine at the same time. Many manufacturers get around this limitation by building into the computer a small bay where various pieces of equipment can be docked when needed. These days, most of these bays are hot-swappable, meaning that the user can remove, say, a diskette drive, and insert a CD-ROM drive without rebooting the computer.

Manufacturers may refer to a notebook as having a three-spindle design, by which they mean that three such peripherals are in the machine at one time, such as a fixed hard drive, a CD-ROM drive, and a diskette drive, and no swapping is required to use them. So, if you encounter the term while looking at notebooks, just remember that the more spindles, the more convenient the computer is to use.



The IBM Thinkpad uses a typical hot-swappable bay for switching among drives.

The Bottom Line

Notebooks are more expensive than similarly equipped desktop PCs. But the convenience offered by a notebook's portability and small size often outweighs the expense. As prices have dropped for desktop PCs, they

have also dropped for notebooks. And at the same time, notebooks have become smaller, lighter, and more powerful. Armed with this information, and your own common sense, you should be able to find the right notebook for your needs at the right price for your budget. Happy shopping! ■

by Rod Scher

Microsoft Word 2000

Selective Printing & Using Hidden Text

- Word Processing
- Beginner
- 2000 for Win9x

Microsoft Word 2000's versatile print options let you print just the portions of a document you select. Its handy Hidden Text feature lets you add hidden comments and annotations to documents that readers can only view on-screen.

Selective Printing

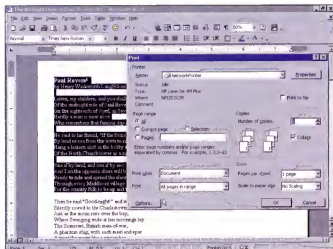
Pressing CTRL-P (or clicking the File menu, then Print) brings up the Print dialog box, which provides a variety of options for printing the current document that vary depending on your printer's capabilities. Typically, Word lets you select a print range, or portion of the document you want to print. If you click Pages in the Print dialog box, you can specify a print range using page numbers. To select a print range within a page, close the Print dialog box, then click and hold down your mouse button and drag your cursor across the portion you want to print. Press CTRL-P, click the Selection radio button in the Page Range section of the Print dialog box, and click OK.

Hidden Text

Pressing Word's Show/Hide button (¶) on Word's Standard Toolbar) or pressing CTRL-SHIFT-8 displays otherwise invisible characters such as tabs, spaces, and paragraph marks. If your toolbar doesn't have a Show/Hide button, click the Tools menu, Customize, and the Options tab. Remove the check mark

from the box next to Standard And Formatting Toolbars Share One Row. Click Close. If you still don't see the Show/Hide button, click the View menu, click Toolbars, then click Standard in the submenu to display the Standard toolbar.

Showing a document's hidden characters is a formatting technique that



Text formatted as Hidden Text displays on-screen with a dotted underline, but it won't appear in printed documents.

comes in handy if you're troubleshooting document layout. For example, if you apply Center align formatting to a heading but it doesn't center correctly, click the heading three times to select it, then click the Show/Hide button. This may reveal that you have added spaces at the beginning or end of the heading; deleting them should correct the skew.

You can control which hidden characters display in your document. Click the Tools menu, Options, and then the View tab in the Options dialog box. In the Formatting Marks section, click the checkbox next to the characters that you want to display or hide. In addition

to conventional hidden characters such as Optional Hyphens, Paragraph Marks, Spaces, and Tab Characters, Word provides an option called Hidden Text. If you select Hidden Text, Word will display all characters formatted as hidden text with a dotted underline; otherwise they will not appear. When you print a document with text formatted as hidden text, the hidden text elements do not print.

It's easy to format notes, comments, annotations, and other document text as hidden text. Hidden text appears in Page Layout, Normal, Outline and Master Document views if you've directed Word to display it. Keep in mind that you don't delete hidden text by choosing not to display it. It is still there, and others can still view it (whether you want them to or not) by selecting the proper options.

To hide text, select it and press CTRL-SHIFT-H (or click the Format menu, click the Font tab, and then place a check mark in the box next to Hidden in the Effects section). Click OK. The text will disappear from view unless you've elected to display it (see above). Be careful not to highlight the blank line between two paragraphs

when hiding text. If you do, Word automatically formats any text you type in the blank line space as hidden text.

Word's Hidden Text options are great for providing writing prompts, guided questions, review instructions, and other directives for readers. To make hidden text easier to see, apply a different font color during formatting. Simply select the text you plan to hide, click the down arrow next to the Font Color (A) button on the Formatting toolbar, then click a bright color such as red. With the text still selected, press CTRL-SHIFT-H. ■

by Carol S. Holzberg, Ph.D.



Microsoft Money 2001 Deluxe

Tips For Entering Transactions

- *Personal Finance*
- *Beginner*
- *2001 for Win9x*

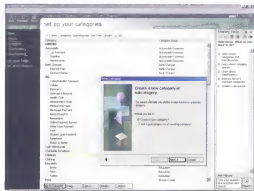
When using a financial software package such as Microsoft Money 2001 Deluxe, the accuracy and relevancy of the information you enter are vital. The reports and graphs Money produces will reflect the quality of the information you place in the program. Poor data yields poor results that even the best software package can't fix, but we'll give you 10 tips for making sure the information you type into Money yields results that are useful for you.

1. **Pick categories carefully.** When entering a transaction in your account register, Money will ask you to select a category for the transaction. Selecting categories might seem like a hassle, but it's the key to tracking budgets and spending habits.

2. **Use subcategories, too.** For even greater accuracy in tracking spending, Money uses a combination of categories and subcategories. Instead of clicking on the Category text menu followed by the Subcategory text menu, you can save time by clicking on the Subcategory text menu first. Money then will display all categories and subcategories, allowing you to make a quick, single selection.

3. **Don't automatically accept Money's category suggestion.** When you enter a transaction, Money guesses the most relevant category based on the name of the payee or the payee's previous category. Although this is a helpful feature, the software isn't going to guess correctly each time. Don't be afraid to change the category designation suggested by Money (after all, you aren't going to hurt the software's feelings).

4. **Split it up.** Sometimes you'll have to split a transaction between multiple categories for greater accuracy. Instead of selecting a category after entering the amount, just click the Split button to the right of the Category row. You then can select the categories you need and



You can create new categories and subcategories in Money to meet your financial needs.

the amount of the transaction to credit to each category in the Multiple Categories window.

5. **Personalize your category list.** Money's default category list might not work well for you; to edit your category list, click the Accounts & Bills menu and the Categories & Payees command. Click New to create a new category or subcategory, or click Modify to change the name of a category or subcategory.

6. **Avoid ambiguous categories.** Some of Money's categories are seldom useful, such as Miscellaneous and Cash Withdrawal. Such categories won't tell you anything about your spending habits, so try to avoid using them.

7. **Dealing with cash.** For those trying to budget and track spending habits, cash transactions and ATM withdrawals

will cause plenty of trouble. Cash seems to have a habit of disappearing before you know where it goes. To combat this problem, try writing on the back of your ATM receipt where you spent the cash. Then, when you enter the ATM withdrawal in Money (by clicking Common Withdrawals), use the Split button to allocate the spending to the correct categories.

8. **Deposits need categories, too.** If you want to track your income taxes, 401(k) savings, or health insurance premiums, using Money's categories for your deposits (especially paychecks) is important. As you're probably painfully aware, your take-home pay is often sub-

stantially less than your salary thanks to a series of standard payroll deductions. The first time you enter a payroll deposit, select Paycheck from the Category text menu, then answer the questions Money asks to identify your standard payroll deductions. That done, you can enter deductions each time you deposit a paycheck by clicking the appropriate tabs along the top of the Paycheck window.

9. **Changing categories is hard to do.** Be as thorough as possible when initially setting up your categories, because there's no easy way to make sweeping changes later. If you choose to not use subcategories at first, for instance, and then decide to use them three months later, you'll have to edit all your previous transactions one by one. Also, choose the category names you use carefully starting with the first transaction you enter. If at any time you edit the name of a category or subcategory, Money will automatically change the name throughout the program.

10. **Keep up.** Probably the best advice for creating accurate spending reports is to enter data into Money on a regular basis. Using the software two or three times per week should be plenty. ■

by Kyle Schurman

Microsoft PowerPoint 2000

Navigating The Presentation

- Microsoft PowerPoint 2000
- Beginner
- 2000 for Win9x

A PowerPoint presentation is like a multifaceted diamond: You can view it in a variety of ways, depending on what you want to see. PowerPoint includes so many views it's relatively easy for a new user to get lost. Normal view, Slide Sorter view, Outline, Notes Page, what's a user to do? Well, you can easily switch from one view to another and navigate between the slides to find just the information you want. We'll help you determine which view is the best for the purpose, and we'll show you how to go to specific slides, no matter which view you're using.

Each of PowerPoint's views has its own special emphasis. For example, you can use Slide view to see and modify the color, graphics, text, and background for each slide. Slide Sorter displays miniatures of each slide and is excellent when you want to restructure your presentation by adding, deleting, or moving slides. Use Outline view to check the flow and content of the presentation; the Notes Page view is a good choice to develop speaker notes. Want the best of all worlds? PowerPoint's Normal view lets you simultaneously see three panes: the current slide, its speaker notes, and the presentation's outline. Of course, when you're finished using other views to create your presentation, you can use Slide Show to view the whole thing.

To switch among any views, click the appropriate View button located at the lower left corner of the application window. Alternately, choose the view

you want from the View menu. One word of warning: Not all the views are included as buttons or as commands on the View menu, so you may need to hunt around a little to find the one you want.

Getting Around

After you display the view you want, you can navigate to a specific slide to edit or display. However, the way you find the slide depends on which view you're using. For example, in Slide view you can press PAGEUP or PAGEDOWN to move the display up or down one slide at a time. Pressing CTRL-HOME displays the first presentation slide, and pressing CTRL-END quickly moves the pointer to the last slide. If you'd rather use the mouse, you can click the Next Slide or Previous Slide buttons on the vertical scroll bar.

You can also drag the box on the vertical scroll bar until a ScreenTip displays with the slide number and then release the mouse.

The method you use to move to a specific slide in Normal view depends on which pane (slide or outline) you're using. In the Slide pane you can drag the vertical scroll bar until the

slide you want appears. To move to a particular slide in the Outline pane (or in Outline View, for that matter), use the vertical scroll bar to move up and down until the slide icon you want is displayed, then click it.

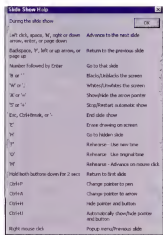
It's relatively easy to go to a specific slide in Slide Sorter view, which displays your presentation slides as a series of miniatures; click the thumbnail for the slide you want. If the presentation is particularly long, you may first need to scroll to the slide using the scroll bars.

Going to a specific slide when you're running your slide presentation as an electronic slide show is a bit more involved. For a complete list of keyboard shortcuts you can use, launch your slide show by clicking View and Slide Show and then press F1. If the list of keyboard shortcuts seems daunting, don't worry because after using some of them a few times,

it's easier to remember them. Memorizing a few basic commands will help you display a specific slide in any slide show seamlessly. For example, to move to the next slide, you can click the mouse, press N on your keyboard (or Next), press PAGEDOWN, or press the Down arrow. To display the previous slide, you pretty much do the opposite: Press P (or Previous), the Up arrow, or PAGEUP.

Spend a few minutes becoming more familiar with ways to display and navigate your PowerPoint presentation. The next time you're on call to develop or give a presentation, you'll be glad to have a few navigational tools at your fingertips. ■

by Linda Bird



Use the list of keyboard shortcuts to move quickly between slides in an electronic slide show.



Microsoft Excel 2000

Working With Multiple Worksheets

- **Spreadsheets**
- **Intermediate**
- **2000 for Win9x**

Admit it. Even in this electronic age, you probably still organize some of your personal or business information in a traditional, three-ring binder, complete with those colored tabs to help you quickly locate specific topics. Interestingly enough, Microsoft duplicated this idea electronically when it set up Excel files. Each Excel file, known as a workbook, includes a series of individual worksheets. Think of this way: The entire Excel workbook is like a notebook, and the individual worksheets are like pages in the notebook. Once you understand this arrangement, you can use it to effectively keep track of information in Excel.

For example, you can track production, income, spending, or sales over a 12-month period by setting up a worksheet for each month and keep all of the worksheets "clipped" together in a workbook. This arrangement gives you quick access to the information while keeping it organized. We'll show you how to use this system, along with a few tips for working with workbooks more efficiently.

Getting Around

Each new Excel workbook file automatically includes three worksheets (the tabs along the bottom are labeled Sheet 1, Sheet 2, and Sheet 3), and you can add or delete worksheets, from one to 255 of them, so the workbook better fits your needs.

To add a worksheet to a workbook, right-click a worksheet tab and click Insert on the shortcut menu. On the General page of the Insert dialog box,

double-click the Worksheet icon. Alternately, choose Insert, Worksheet. To remove a worksheet, choose Edit, Delete Sheet or right-click the worksheet's tab and click Delete. If the worksheet includes data, you'll be prompted to confirm your action—an important warning because you can't Undo when you delete a worksheet.

After you've put worksheets in a workbook, you'll want to see the one you're ready to work on. If you can see

for example, However, it's helpful to give the worksheets more descriptive names that indicate the data they include, such as January or Northern Region. To rename a worksheet, double-click its worksheet tab and then type the new name before pressing ENTER. Alternately, right-click the tab, click Rename from the shortcut menu, type the name, and press ENTER.

Moving & Copying Worksheets

You'll probably want to rearrange the worksheets to better suit your needs. For example, you may want to put the months in chronological order or alphabetize sales districts.

Moving a worksheet is a snap: Right-click its tab and click Move Or Copy from the shortcut menu. In the Move Or Copy dialog box, click to highlight the sheet you want the selected sheet to precede and click OK. It's much easier to move worksheets, however, by clicking the tab, holding down the mouse button, dragging the tab until the black triangle indicates the tab is where

you want it, and releasing the button.

There may be times you want to copy an entire worksheet, such as when a worksheet includes the layout, data, or format that you want to use (with some revision, of course) for another worksheet. To copy a worksheet, right-click the tab for the worksheet you want to copy and then click Move Or Copy from the shortcut menu. In the Move Or Copy dialog box, click the Create A Copy checkbox before clicking OK. When you look again at the tabs, you'll see another worksheet with the same title and a numeral two (2) in parenthesis. Rename the sheet as described above. ■

by Linda Bird



Worksheets keep related information in a workbook.

the worksheet's tab, click it to display the sheet. If you can't see the worksheet's tab, click the tab-scrolling arrows to the left of the worksheet tabs.

You can also drag the tab split box (the small box between the worksheet tabs and the horizontal scroll bar) to change the display proportions between the worksheet tabs and the horizontal scroll bar. For example, if you drag the tab split box to the right, you uncover more of the worksheet tabs but make the horizontal scroll bar shorter. To reset the original display proportions, double-click the tab split box.

Renaming Worksheets

By default, each worksheet's name is pretty generic; you'll see Sheet 1,

Outlook Express

Using Address Book

- *E-mail*
- *Intermediate*
- *5.x for Windows*

Throw away that paper address book and open up its electronic counterpart, included free

with Microsoft's Internet Explorer suite and newer versions of Windows.

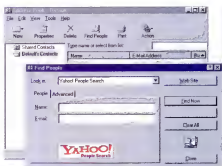
The Outlook Express 5.x Address Book stores e-mail addresses, phone numbers, and home and business addresses. You can import existing contact information from programs such as Microsoft Exchange and Eudora, as well as from any program that exports CSV (comma-separated values) text files, such as Microsoft Outlook. The Address Book also stores e-business cards, provides access to online directory services, and helps you create mailing lists of family members or friends from the local Volkswagen enthusiast club.

To open Address Book, click the Addresses button in the Outlook Express toolbar, or click the Tools menu and click Address Book. You can also access the Address Book from the Windows Start menu; just click the Start button, point to Find, and click People. To retrieve stored e-mail addresses from within a new message window, click the To, Cc, or Bcc button(s).

Adding Contacts

The quickest way to add your online friends' contact information is to open an e-mail message from one of them, click the Tools menu, and point to Add To Address Book. You can add the addresses of the message's sender or any of its other recipients by clicking the appropriate command in the resulting drop-down menu. If the e-mail includes only a person's screen name, you'll probably want to enter

their actual name along with street address and telephone information. You can also configure Outlook Express to automatically add the e-mail addresses of those to whose e-mails you reply. Click the Tools menu, Options, the Send tab in the Options dialog box, then place a check mark in the box next to Automatically Put People I Reply To In My Address Book.



Internet Explorer's Outlook Express Address Book lets you store e-mail addresses for the people you know and look up information for people you don't.

To create a new contact from scratch, open Address Book, click the New Contact button in the Address Book toolbar, and click New Contact. Type the name and personal information you want to store in the appropriate blanks, enter the contact's e-mail address in the E-mail Addresses: blank, then click the Add button (note that you can store multiple e-mail addresses for contacts if you like).

There are several tabs across the top of the Properties dialog box for adding detailed information, such as Home and Business, which include storage space for personal or business Internet addresses. The Personal tab stores information such as birthdays and anniversaries, as well as notes you might want to jot down. The View

Map button located on the Home and Business tabs automatically launches your Web browser, opens the Maps section of Microsoft's Expedia.com Web site, and pinpoints the address.

You can combine addresses into group lists for sending e-mail messages to multiple recipients by opening Address Book, clicking the New Contacts button, and clicking New Group. Type a name for the group in the Group Name: field, then click the Select Members button to call up a list from which to choose your members. You can go back any time to add or remove group members.

Searching & Printing

Address Book lets you run a quick search for contacts by typing the name you're looking for in the Type Name Or Select From List: field. As you type, Address Book removes the names that don't match or automatically selects the right name, depending on what version you're using. Click the Find button in the toolbar and click People for a more advanced search. The resulting dialog box lets you search by name, e-mail address, street address, and/or phone number. When connected to the Internet, you can search online e-mail directories such as Bigfoot and InfoSpace by opening the drop-down menu in the Look In: field and clicking the appropriate option.

You can print all or part of the Address Book, although it lacks extensive customization. Select individual entries or hold down the CTRL button as you click names to select multiple entries. Then click the Print button in the toolbar and choose a print style. Business Card prints phone numbers and e-mail addresses with each name, Phone List prints only phone numbers and names organized alphabetically, and Memo prints all the information you've entered about each person. ■

by Alan Phelps



Going Online

Synchronizing Files Online With fusionOne

• Online
• Intermediate

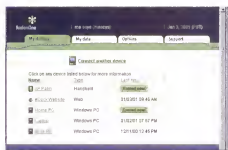
Work computer. Home computer. PDA. Notebook. Sometimes the hardest part of using all these gadgets is keeping them all on the same page. A free Web service called fusionOne helps you tackle that task using the connectivity of the Internet.

The fusionOne Web site description (<http://www.fusionone.com>) makes it all sound a little magical, but the reality is cool enough. Basically, fusionOne copies files, address book entries, e-mail messages, appointments, and other data from your computer to the fusionOne server over the Internet. When you log in using another computer, fusionOne downloads all that information to the new machine. If you've updated, added, or deleted files on one computer, it updates, adds, or deletes them on the server and then on the other computer. You can also set fusionOne to keep your PDA (personal digital assistant) or mobile phone up-to-date for on-the-go access.

In Synch

Start by heading to the fusionOne site on one of your Internet-connected machines. Click the Sign Up button, fill in the registration information (you can use an alias if you like), and click the big yellow Sign Up Now! button at the bottom of the screen. Continue to follow the on-screen instructions to set up the various devices you use and the type of information you want to synch on each device. Note that you don't have to link all types of data to every device; leave the appropriate checkbox blank if you don't need your work tasks at home.

The fusionOne service will then install client or "agent" software on your computer. The agent will automatically start each time you boot your PC, and you should see a small fusionOne logo icon in the System Tray on the right end of your Windows Taskbar. To synch the information on your current machine with the server, just right-click the fusionOne icon and choose



Keep files, appointments, contacts, e-mail, and more in synch across multiple computers, PDAs, and other devices with fusionOne and eDock.

Synchronize. The data will flow in the background as you do other work.

When you find yourself at another machine, go to the fusionOne Web site again and click the Account Login button. Sign in with your user name and password. If you don't see your current device listed with a Connect Now button next to it, click the Connect Another Device link. Choose the type of device and set up fusionOne on the new system.

After you've set up agents on all of your computers, keeping information in synch is fairly simple. Synchronizing your files manually as outlined above gives you the most control over the process, but to keep your various files as current as possible it might be best to automate. Right-click the fusionOne icon on each computer and click

Open. In the fusionOne agent, click the Scheduler button. The Scheduler dialog box includes several options for automatically synching when specific events happen, such as receiving e-mail, as well as the option to update at specific time intervals.

Universal Access

One of the best features of fusionOne is that even when you aren't near one of your own synchronized machines, you can still access all your information from any Internet-connected computer. Log into your account at the fusionOne site, click the My Devices tab, then click Connect Another Device. Click the eDock link. Once eDock appears in your devices list, you can visit the eDock Web site (<http://www.edock.com>) from any computer. Log in with your fusionOne ID and password, then use the links on the left of the screen to navigate to all your stored information. You can also add new contacts, appointments, tasks, files, and other data that fusionOne will download to your other devices next time you synch them.

Keeping all of your data in a variety of locations may eventually lead to one of the downsides of synching: conflicting information. This can happen when you make some sort of change to a file at work, then make a different change to the same file either at the eDock site or another device before you've had a chance to synch the work computer. When fusionOne sees that the files in both locations have changed since the last synch, you'll see a Conflict Detected dialog. Read the options carefully; you will be able to keep the information on the current device, overwrite it with the information from the server, or do nothing for now and fix it later.

Minor problems aside, synchronizing devices can make your digital life easier. Forget diskette transfers and give fusionOne a try. ■

by Alan Phelps

Print Shop Deluxe 10

Linked Text Boxes

- Desktop Publishing
- Intermediate
- 10 for Win9x

Articles in newspapers and magazines often begin on one page but continue elsewhere.

For example, the news lead on page one, column one may continue on the back page, column three. Print Shop Deluxe provides page layout controls to accommodate this publishing technique, letting users thread (or connect) text in nonadjacent text boxes. Threading simplifies editing. If there's not enough room to accommodate article text in the first text box, it automatically spills or flows into the second. Similarly, if you add or delete text in the first box, flow adjusts in all linked text boxes that follow.

Linking Text Boxes

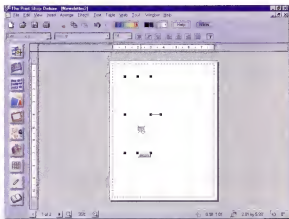
To add text to a Print Shop Deluxe document, you must either create a text box and type in or import the text, or replace boilerplate text in an existing QuickStart Layout text box.

Launch the program. Double-click Newsletters on the main menu and then double-click Personalize A QuickStart Layout. Double-click Business in the Select A Theme dialog box and double-click All About Electric Stuff. You'll be prompted to insert the Photo Shop Deluxe Program Disc. Do so and click OK.

The Design Desk displays the two-page Electric Stuff newsletter layout. Click the pointer in each column. Notice the chain link and arrow icons at the bottom of each text box. The link icon lets you connect or disconnect text blocks. Clicking the Right arrow takes you to the next box in the

chain of links. Clicking the Left arrow at the top of a text box takes you to the previous linked text box.

To replace existing boilerplate text with imported text from another file, click a text box to select it and double-click anywhere inside the text box to activate editing mode. Click, hold down your mouse, and drag it across the text



It's easy to create and connect text boxes such that imported text automatically flows from one linked box to another.

you wish to replace. From the Text menu, click Import Text. In the Open dialog box, select an ASCII (American Standard Code for Information Interchange) plain text (TXT) or an RTF (rich-text format) file to import. Click Open. The imported text replaces the highlighted text. Spillover text (if any) flows through the other connected text boxes. If paragraph formatting for the imported text doesn't look right, select the imported text, click the Text menu and Paragraph, and set Left margin, Right Margin, and First Line Indent fields to 0. Set Line Spacing to 1. There should be 0 spacing before and after the paragraph. Click OK.

You can create and connect text boxes so spillover text flows from one

linked box to another. Click the Edit menu and New, and then click Newsletters (Business tab). Double-click Start From Scratch. Double-click Tall and the Design Desk displays A Blank Newsletter.

Click the Insert Text Box button on the Object toolbar to the left of the Design Desk and click Insert Text Box. Draw a 2-inch wide by 6-inch long box, using the horizontal and vertical rulers as guides.

Click the Insert menu and Pages. In the Add Pages dialog box, enter 1 in the Number Of Pages To Add field. Click the After Current Page radio

button. To create a page with an identical text box, click the Add Copies Of Page radio button. Click OK. Your second page will have a text box in the same position as the one on page one. Click the page navigation icon in the bottom, left corner to switch to page one. Click the text box to select it and click the text box's link icon. The pointer changes from an arrow to a text flow pointer. It will have an X running through it. Switch to page two. Position the pointer over the second text box, then click to connect it. Overflow text you import into the first text box automatically flows into the text box on the second page.

Unlinking Text Boxes

To unlink connected text boxes, click the box you want to disconnect, then click the Left arrow at the top of that text box to select the source text box. Click the Link Text Box at the bottom of this source text box. Position the pointer anywhere outside the box as long as the pointer still has an X running through it. Click to sever the link between the two text boxes. ■

by Carol S. Holzberg, Ph.D.



Quicken 2001 Deluxe

Using Quicken With TurboTax

- *Personal Finance*
- *Advanced*
- *2001 for Win9x*

As you prepare your 2000 federal income tax return, wouldn't it be helpful to have a

presorted list of deductions for which you're eligible? Better yet, how about a list you could import automatically into your tax preparation software?

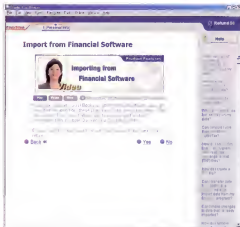
Using Quicken Deluxe 2001 in conjunction with TurboTax 2000 gives you the option of copying tax-related data from Quicken into TurboTax. This saves you several hours of thumbing through stacks of receipts, most of which (if you're like some of us) are unreadable, poorly marked, or both.

Day-To-Day Operations

Keeping up with the data entry necessary to track tax-related transactions requires discipline, but as long as you're using Quicken two or three times per week (and as long as you're selecting categories for the transactions you enter) you should experience few problems.

When creating some kinds of accounts, Quicken lets you indicate whether their assets are tax deferred. Click the Tax button in the Enter The Starting Point Information window to mark an account as tax deferred. For accounts you've already created, open the Account List window (click the Finance menu and Account List), highlight the account in question, and click Edit. In the Account Attributes area of the window, click the text link in the Actions column to the right of Tax Deferred. Then select the tax forms to use with the account.

To set up tax-related categories, click the Finance menu and Category &



When you run TurboTax for the first time you can import your Quicken data automatically.

Transfer List. In the category window, you'll see the categories that have been set up as tax related marked with a T in the Tax column. To change the tax implications of a category, highlight the category and click Edit. Now select the tax forms to use with the category. If you set up tax forms with individual categories, you won't need to enter tax information for individual transactions. However, you will have to remember which categories you've designated as tax related while you're selecting them for use with each transaction. You'll also have to enter a category for each transaction, or this timesaving feature won't work.

Click the Taxes menu and Tax Center. You'll see a list of tax-related alerts regarding your accounts entered in Quicken as well as a calendar of upcoming tax-related events.

Synching With TurboTax

Although keeping up with the work required to enter tax-related transactions in Quicken can be difficult, the

process of actually copying that data to TurboTax is easy. When you install TurboTax and run it for the first time, the software will automatically detect an installed version of Quicken on your PC. As you begin to enter data,

TurboTax will ask whether you want to import financial information into the tax software. Click Yes to import your tax-related data from Quicken. Unlike previous incarnations, TurboTax 2000 lets you import selected categories rather than forcing you to import them all at once. If you initially decide not to import the data, you can do so later by clicking the File menu and the Import command. Then select Quicken from the list and click Continue.

You shouldn't assume the data you've imported is perfect, though; after all, everyone makes mistakes. Always double-check the data for accuracy before completing your tax return. If you find major errors in the imported data, we wouldn't recommend changing the errors in TurboTax directly because you'll end up with mismatched data between TurboTax and Quicken. Instead, click File and Remove Imported Data, which tells TurboTax to remove all of your data imported from Quicken. Open Quicken and make the necessary corrections, then import the data back into TurboTax.

While using Quicken to track your tax-related items will save you a lot of time when preparing taxes with TurboTax, keep in mind that you'll probably use up that time when setting up the tax-related data initially in Quicken. If you don't think you can select categories religiously throughout the year, you probably won't want to start. Having only six months of tax items marked accurately in Quicken won't help you much when it's time to use TurboTax to calculate 12 months of taxes. ■

by Kyle Schurman

WordPerfect 9

Create A Master Document

- WordPerfect 9
- Advanced
- 9.0 For Win9x

A LONG DOCUMENT, such as a book with many chapters or a manual with many sections, can be difficult to work with, especially if it contains numerous graphics. When keeping track of where you are takes longer than what you want to do, take advantage of the time- and memory-saving Master Document. Simply stated, a master document acts as a container that holds all the pieces of your eventual final product. The pieces may be pulled from other, shorter files that contain one section or one chapter of the longer whole. Within the master, you store links to these separate files, plus extras, such as a Table of Contents, an index, an introduction, headers, footers, setup, and print information.

Set Up A Master Document

Begin a new, blank document and save it, using a filename that pertains to the entire book or manual. Switch to Draft View to navigate and view your Master Document as you set it up. Take care of the basic Page Setup for the entire document, setting the page size, margins, orientation, and any multiple-page setting and binding. Type the cover or opening page material, formatting as necessary. The first page of your document will automatically be a right or odd page if you chose Book or Tablet in Page Setup. Therefore, if you want the next page to also be a right or odd page, click New Page in the Insert menu at the end of your title material. In the Format menu, go to Page, and click Force Page. Choose Current Page Odd, then OK. You are now ready to insert

chapters or sections as subdocuments into the master document.

Ideally, a subdocument should contain all of the material for a chapter or section, fully formatted and ready for insertion. Store subdocuments with the master document. All graphics, tables, captions, and other material for the chapter should be in that chapter's file. The only variables are the headers and footers. For best results, do not set page numbering within an individual chapter's file. Most importantly, be consistent among the subdocuments.

A nice combination is to set headers or footers in individual subdocuments, using A and B for left and right or top and bottom setups, then set the page numbers in the master document. You can set chapter or section numbers manually within the subdocument or set them prior to each subdocument insertion in the master document, which is more flexible if you plan to add or delete chapters.

Assuming you're in position to insert the first chapter or section in your master document, in the Format menu go to Page and click Numbering. Click Set Value to set a starting page, chapter, and volume number for the new section. Be sure to choose a position and set up any custom format you need and click OK.

Switch to Page View to set up Headers and Footers if you didn't include them in the individual subdocuments. Use the Header/Footer

Property Bar to set alternating A and B headers and footers if desired. Switch back to Draft View when done.

Next, in the File menu, go to Document and click Subdocument. Locate and select the subdocument to insert it and click Include. In Draft View, a nonprinting gray bar indicates the name of the subdocument. In Page view, a nonprinting icon indicates the presence of a subdocument. If the next section or chapter begins on a new page, insert a New Page break after the subdocument. If necessary, you may want to do another Force Page Odd, as well as a new Page and Chapter number before inserting the next subdocument.

Take A Look

You can view the complete master document by expanding the subdocuments. In the File menu, go to



The Draft View makes it especially easy to see Page separations and subdocument files within a Master Document.

Document and click Expand Master. In the Expand Master Document dialog box, check the subdocuments you wish to see and click OK. You may view the entire document in Print Preview to see how it all

fits together.

To collapse the subdocuments, in the File menu go to Document and click Condense Master. You have the option to collapse and save each subdocument. For best results on changes, however, go directly to the subdocument and make changes to text, layout, etc. there. Once saved, the master document will have access to the most recent changes. You can also use Reveal Codes to find and delete extra instances of code within the master document. ■

by Anne Shevrin



Lotus 1-2-3

Introduction To LotusScript

- Spreadsheets
- Advanced
- 9.5 for Win9x

Lotus SmartSuite products and Lotus Notes come with a feature called LotusScript that's

worth looking into if you spend lots of time customizing your Lotus 1-2-3 worksheets. It's a programming language that lets you automate tasks, streamline complex procedures, create specific dialog boxes for users, and even create 1-2-3 applications.

Why LotusScript?

Using macros to automate worksheet operations is handy, but LotusScript gives you more specific control, especially over complex tasks involving a number of commands or logic loops. Because it is compatible with other Lotus software packages, LotusScript can perform operations across applications, such as calculating data in a 1-2-3 worksheet for a Notes application or retrieving data from an Approach database.

Learning to take advantage of all LotusScript's features takes time, but getting started is easy. If you're familiar with development applications such as Microsoft Visual Basic, or if you've written macros in 1-2-3 or Approach, you can comfortably make the switch to LotusScript. Even if you have no programming experience, LotusScript's Record Script feature makes it simple to create scripts by letting you record the actions you want to automate.

How To Use LotusScript

Start using LotusScript by recording your own script, or string of LotusScript commands. While you are recording, 1-2-3 takes any keystrokes

and mouse actions you perform and adds them to the script.

To begin, click the Edit menu, point to Scripts & Macros, then click Record Script. Choose a name for your script and type it in the Script Name: text field in the Record Script:

dialog box, then click Record. Keep in mind that LotusScript names must follow certain format rules (they must be 40 characters or less in length, etc.), or 1-2-3 won't accept them; instead it will give you an error message to remind you about some of them. 1-2-3 then displays your worksheet with a red Stop Script Recording button and a yellow Pause Or Restart Script Recording button in the upper left corner of the worksheet (labels appear only when you point to the buttons). Perform the task you want to add to the script. If you need to do something you don't want recorded, click the Pause button and do it, then click it again when you are finished to resume recording.

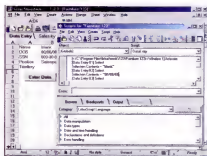
When you have finished the task, click the Stop button. Your script will appear inside a Script Editor window titled Scripts For "[your worksheet's name]." To save your work, click the File menu, click Save Scripts, then click OK, and 1-2-3 saves your script as part of the current worksheet. Close the Script Editor and run the script to test it by clicking Edit, pointing to Scripts & Macros, and clicking Run. Make sure the Script button is selected, then

click the name of your script in the list below and click Run.

Where To Go From Here

After recording a few scripts, you may want to use the Script Editor to further refine them. Click the Edit menu, point to Scripts & Macros, then click Show Script Editor. Open the Object pull-down menu and click (Globals), then click the script you want to edit from the Script pull-down menu to the right. The text in the box below

is your script; edit as needed and save by clicking the File menu, clicking Save Scripts, and clicking OK. You can make completed scripts easily accessible by attaching them to the Actions menu, creating keyboard shortcuts for them, or linking them to



You can create new scripts or edit previously recorded scripts in 1-2-3's Script Editor.

SmartIcons on the main toolbar.

Don't worry if you have questions; 1-2-3's LotusScript help files provide lots of good information on understanding, creating, and editing scripts. Click the Help menu, click Help Topics and the Help Topics button that follows, click the Contents tab, then click LotusScript in the list of topics below. If you've installed them (they aren't included in SmartSuite's Default Features—Automatic Install option), a wealth of useful information will appear. If not, 1-2-3 will provide instructions on how to do so. For further information, check out the LotusScript & SmartSuite Documents page at Lotus' Web site (<http://www.lotus.com/home.nsf/welcome/suitedev>). Lotus offers several free, downloadable LotusScript guides that you can open with Adobe Acrobat Reader. ■

by Tracey Dishman Patterson

Quick Tips

Secrets To Succeeding In Common Tasks

Send Us Your Tips!

We're looking for your best hardware, software, and Internet tips. Send detailed instructions for using your tips, along with names of the specific products they work with and the name of the city where you live, to editor@smartcomputing.com. We'll include the best reader submissions in upcoming editions of Quick Tips and send you a *Smart Computing* gift if we use your tip.

Broadband

✓ Many computer users are getting second or even third PCs for their homes, networking them, and switching from slow dial-up Internet connections to fast broadband connections. If you have more than one PC at home and you have a broadband connection, you'll probably want to buy a router so you can channel all of the PCs in your home through one primary Internet connection. Consider buying one that has a hardware firewall built into it, such as NETGEAR's RT314 or D-Link's DI-704 or DI-707 routers. The included firewall will provide an extra layer of security for your PCs.

Photoshop 5.5

✓ You can enlarge or reduce an image's canvas size in Photoshop 5.5 without manually adjusting settings in the Canvas Size dialog box. Simply access the Cropping Tool and crop your entire image. Next, click one of the small resizing squares surrounding the image and drag the crop

lines until you've outlined the area of your desired canvas. Press ENTER when you're done. Your image should now fit within your newly cropped canvas.

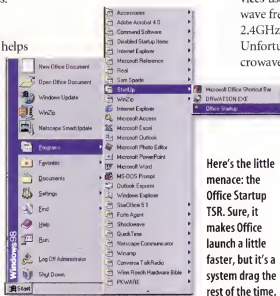
WordPerfect 9.0

✓ WordPerfect 9.0 helps you create two-sided documents, even if your printer doesn't have that feature. To begin, click File on the Menu bar and click Print. Make sure that the printer you want to use is selected under the Current Printer field and check the Print In Reverse Order checkbox. Next, click the Two-Sided Printing tab. Under Manual, click the Step 1: Print Odd Pages radio button and click Print. Reinsert your pages so that the printer will print on the blank sides, click the Step 2: Print Even Pages radio button, and click Print.

Antivirus

✓ Norton's AntiVirus program keeps those nasty

viruses from ruining your PC. But you need to update it regularly because new viruses are discovered daily. With Norton's AntiVirus LiveUpdate feature, you can quickly download and install the latest virus protection. Make sure your Internet connection is up and running, open Norton AntiVirus, and click the LiveUpdate button at the top of the Norton AntiVirus Window. The program will see if any virus updates are available and will automatically install them. You should do this about once every week or two, once per month at the very least.



Windows 98

✓ Here's a tweaker's tip to help you goad your Windows 98 PC into running a little faster: trick it into thinking it's a network server. On the Desktop, right-click My Computer and select Properties. Click the Performance tab, then File System. If the entry

blank next to Typical Role Of This Computer reads Desktop Computer or Mobile Or Docking System, click the Down arrow and choose Network Server. While you're there, click the slider bar next to Read-Ahead Optimization and drag it all the way to the right (Full). Finally, click Apply, OK, Close, and Yes to restart your PC.

Wireless Transfers

✓ Home networks using the HomeRF or 802.11 standards are gaining popularity, and we should see more handheld devices using the new Bluetooth technology. Wireless networks and devices use a range of radio wave frequencies near the 2.4GHz part of the spectrum. Unfortunately, so do microwave ovens. If you begin to notice slowed or stalled wireless transmissions when your significant other is heating up Hot Pockets, wait until she's finished. If your office uses a wireless network, make sure that the break room's microwave ovens are far

enough away to minimize interference.

Microsoft Office

✓ What if we told you that your Win98 system probably has a little TSR (terminate-and-stay-resident program) running in the background that slows down your system just so you could enjoy a

slightly faster launch of any Microsoft Office applications you happen to open? If you find yourself indignant at the very thought, take your rage out upon the sneaky little TSR called Office Startup. Click the Start button and Programs, then Startup. If Office Startup appears among the TSRs in the Startup folder, right-click it and select Cut. Now right-click Disabled Startup Items (or Accessories), click Paste, and reboot your PC.

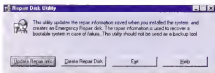
Eye Strain

✓ Feel like you're getting cross-eyed after a long computing session? Even if you have your monitor set to a fast refresh rate (the number of times the computer redraws the screen per second, measured in hertz) of 75Hz or faster, you should know that your eyes aren't out of the woods yet. It's best to take a short break every so often. Look around the room. Take your time and focus your eyes on distant objects, then closer ones. This will help keep your eyes from fatiguing too quickly. Better still, try to avoid massive computing sessions.

Windows NT/2000

✓ Windows NT 4.0 and Windows 2000 users can create an Emergency Repair Disk to solve Registry and other system file problems that prevent the operating system from functioning normally. Click the Start button and Run. WinNT 4.0 users must type RDISK into

the Run field and click OK to access the Repair Disk Utility. Then, just insert a blank, formatted diskette into your computer's drive and click the Create Repair Disk button. Win2000 users should enter NTBACKUP into the Run field and click OK to access the Backup



Windows NT and Windows 2000 have a utility that lets you create a repair diskette to restart your PC after an emergency.

window. Next, click the Emergency Repair Disk button, insert the formatted diskette in the drive, and click OK to begin creating the repair diskette.

Adobe Acrobat 4.0

✓ You can view creation, modification, and security setting information about any .PDF (Portable

Document Format) file you open in Adobe Acrobat 4.0. With a document open, click File and Document Info. Choose the General option to see who wrote the .PDF file, what program the document was created in, when the file was created and modified, how big the file is, and more. You can also select Security to note the document's security settings, such as print, editing, and password restrictions.

WinZip 8.0

✓ Use WinZip to create and span a zipped file across two or more diskettes. In the program's Wizard interface, select the Create A New Zip File option and click Next. Type the path and name of the Zip file that you want to create—for example, A:\New.zip—and click Next. Now, simply drag and drop the files you want to zip into the Wizard's Select Files window or click the Add Files or Add Folders buttons

to locate and add the files or folders that you want. Insert your diskette in the drive and click the Zip Now button. WinZip prompts you when you need to insert a fresh diskette.

Hardware

✓ Have you ever bought a printer, scanner, or other peripheral only to discover that the device is not compatible with your Windows OS (operating system)? You can avoid this headache by checking out the list of compatible hardware for Win98, WinNT 4.0, WinMe, and Win2000 at <http://www.microsoft.com/hcl>. The site lets you search an access table by product or category for information about the compatibility status with Windows. Icons listed beside each product tell you whether the device is compatible with a particular OS or whether Microsoft offers a download to ensure compatibility. ■

Reader Tips

Windows 95/98

✓ If you're having trouble deleting files from legacy word processors or other programs you no longer have on your system, use your DOS prompt (Start button, Programs, MS-DOS Prompt). At the C:\WINDOWS> prompt, type CD\ and press ENTER, then type DIR and press ENTER to see all of the files on your

C: drive. After the C> prompt, type DEL and the name of the file you want to delete. For instance, to delete a file named Test.wks, type: DEL TEST.WKS and press ENTER (leave a space between DEL and the file name). To return to Windows, type EXIT and press ENTER.

*Clyde C. Lockwood
Franklin, Ohio*

Publisher

✓ Open Publisher and from the File menu, click New. On the Publication By Wizard tab, click Greeting Cards. Select a vertical card, such as Balloons Thank You Card. Click the Start Wizard button and click Finish. Click Size And Fold, and change it to Half Page Side Fold (not all cards let you

change this option). Delete, add, or change objects on page 1. Rotate objects on pages 1, 2, and 3 left 90 degrees. On page 4, rotate objects right 90 degrees. To print, set the orientation to Landscape and select two-sided printing.

*Lynne Appel
Fridley, MN*

24x
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Rip a 3-minute song from a CD
in less than 8 seconds with
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Burn a full CD in just 6 minutes. Converts
MP3/WAV audio play lists automatically into
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THAT MEANS NO MORE CD COASTERS.
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Setting Up A Wireless Network

Why You Should Go Wireless & How To Do It

ON THE DECK BEHIND HIS HOUSE, a man relaxes on a chaise lounge, using the notebook computer on his lap to surf the Internet. When he finds the information he's looking for, he sends the page to the printer located in his basement office. Later, he'll retrieve the printout. For now, he loads into his word processor a document from a server located inside the house and, from his comfortable chair in the backyard, makes some last-minute changes to a presentation he's scheduled to give tomorrow.

This is not a scene from some futuristic novel. Wireless networks have arrived, and they're here to stay. Equipment prices are dropping dramatically, while installation gets easier all the time. If you want to take part in the wireless revolution, you can. We'll explain how wireless networks work and give you some tips on setting one up in your home or office. First, however, it's a good idea to take a look at the benefits

of networking in general and to consider the specific pros and cons of wireless networking.

Networking 101

Networks are all about sharing and access. Linking computers together, with or without wires, allows the various computers (generally referred to as workstations) to communicate with each other and with one or more servers. In most networks, the server acts as the central repository for data. All the files that any or all of the workstations are likely to require can reside on the server, and each workstation can access that data as needed.

Networked computers can also share peripherals. For example, in a small office (or, for that matter, at home), several people may occasionally need to use a scanner or a high-quality printer. Rather than purchase multiple scanners or printers, one can connect such peripherals to the network, where everyone with access can share them.

At both home and office, one of the most compelling reasons to install a network is that it allows multiple users to share a broadband connection to the Internet. Generally, one ISDN (Integrated Services Digital Network), DSL (Digital Subscriber Line), or cable modem connection supplies more than enough bandwidth for the needs of many people.

Reasons To Go Wireless

Depending on who you are and what you do, there may be many reasons to install a wireless network instead of a traditional wired one.

Cost. In many cases it's actually less expensive to install a wireless network than a conventional wired network, especially in cases where you wish to network computers located in two separate buildings. Running cable between buildings can be expensive and is sometimes impossible due to digging restrictions and other considerations; a wireless network can provide a simple, straightforward solution.

There's also a long-term cost issue to consider. Companies reorganize all the time. They move groups of people around, reconfigure offices, add new buildings, and consolidate functions. To a lesser extent, the same may be true of your home. You have children, they move out, you switch around or add rooms and



initiate remodeling projects. Whatever the reason, recabling can be an expensive, time-consuming, disruptive process. With a wireless system, you relocate network connections simply by moving PCs.

Reliability. Wired networks have been around a while. Developers and engineers worked the bugs out long ago, and your wired office network is probably pretty reliable. But all wired networks have a weak link: the wires themselves. If wires break, metallic conductors rust or allow water to enter, staff members accidentally cut cables, or workers do a shoddy job of splicing, the result is a cable fault. Cable faults can cripple network traffic, and tracking them down can take many hours.

Mobility. Perhaps the most compelling reason to consider a wireless network is the mobility they provide. A user connected to a wireless network can move around and still remain connected to the network, and even the less sophisticated SOHO (small office/home office) wireless networks can easily cover a small home or office.

Wireless Warnings

As with any technology, wireless networking involves a tradeoff; in this case, the tradeoff is between the convenience of wireless networks and a few potential problems to keep in mind.

Predictability. A wireless LAN (local-area network) relies on the propagation of radio waves. These waves radiate from omnidirectional wireless network transmitters, and walls, large appliances, and other obstacles can interfere with them, degrading the network's performance.

Security. Because by their nature radio waves don't require a physical connection for access, anyone within the broadcast area can, if he or she can obtain the network access code, eavesdrop on network communications. Someone in a nearby parking lot, for example, could very easily compromise an office's wireless network and intercept sensitive data with

an access code and the proper equipment.

Speed. Theoretically, data moves across a wired network at speeds of 10-100Mbps (megabits per second) or faster. A wireless network is much slower, with data traveling at speeds as low as 1Mbps, and as high as 11Mbps. The wireless network's slower speed can make a difference in certain applications. For example, it's difficult to stream video across a wireless network and get good results. Results with audio are better, but still not optimum.

These concerns shouldn't dissuade you from considering a wireless network; there are ways around them all. Just be aware of them as you examine your wireless options.

Anatomy Of A Wireless Network

Like a wired network, the size and complexity of a wireless network may vary depending on its size and what you need it to be able to do. There are a few main ingredients, however, that your network should contain no matter how big or small it will be.

Broadband gateway. This component works like a hub or port, and goes between your server (either a notebook or a desktop machine) and your DSL router or cable modem. In many cases, the gateway also functions as a firewall, protecting your network from external attempts to hack into it through your permanent Internet connection.

Transceiver. As mentioned earlier, wireless networks communicate with radio waves. A network's transceiver sends and receives signals to and from the broadband gateway and the network's workstations.

NICs (Network Interface Cards). A wireless NIC works much like any other network interface card except that, once installed in your desktop

SOHOware's Broadband Internet Gateway (B.I.G.) functions as a hub for its CableFREE NetBlaster wireless transceiver unit.



PCI wireless NICs (network interface cards) let your PC talk to others on a network without attaching cables.



SOHOware's NetBlaster wireless transceiver lets computers on your network share a single broadband Internet connection.



workstation, it sends and receives data via radio waves rather than a physical connection. Wireless NICs often connect to external antennas to extend their effective range.

PCMCIA (Personal Computer Memory Card International Association) NICs. Just like the wireless NICs described above, except they fit into notebook computers' PC Card slots. As with the desktop variety, you can use external antennas to boost the effective ranges of many wireless PCMCIA network cards.

Appropriate software. The gateway requires software (usually hardware drivers, communication software, and application software) to function properly. You'll also need to install drivers and utility software for each NIC you install in a workstation.

Organizational structure. When you set up a wireless network, you're actually connecting your high-speed Internet connection to a device which either sends radio signals to workstations or connects to a separate device that does. The first device (your

network's gateway) may include the transmitter. If the transmitter is a separate piece, it will plug into a port on the gateway; the workstations will transmit data to (and receive data from) that gateway. In a sense, then, the gateway acts as a hub would in a conventional network. The difference is that the workstations transmit data through the hub via radio waves rather than through a physical connection.

On the workstation side, setup consists of installing the wireless NIC and its software. Generally speaking, all you need to do is place the card in the slot and then restart the computer. Windows will note the presence of a new piece of hardware and prompt you for the location of drivers for the card. Your wireless network package should include a CD-ROM with the drivers and other utility software you'll need.

We should point out that your choice of a network technology is not

limited to either wireless or conventional. It's quite common to combine the two technologies, connecting an "access point" to a wired network, and then adding wireless workstations to the network. In fact, in a medium-sized business, it's very possible that several wireless access points will augment a conventional network.

Choosing The Right Equipment

Several well-known suppliers of conventional network hardware now also make and sell wireless network equipment. These include Lucent, 3Com, Compaq, Cisco, Intel, and others. In addition, there are several companies specializing in SOHO (wireless and wired) networks, including SOHware; Raylink, a product line offered by Raytheon Wireless Systems; and ORINOCO, Lucent Technologies' SOHO product line. Choosing between

all these offerings can be tough, but there are two criteria that can help.

Price is the first. If you're planning a business network, you'll certainly be justified in spending more than someone simply seeking to connect Mom, Dad, and Junior at home.

The second is IEEE's 802.11b standard. It's important (especially so in a business environment) to know that the network will function in a certain fashion and according to specified parameters. It's also important to be able to mix and match components from various manufacturers. Now that the standard has been established, most manufacturers are building compliant products, so there's really no reason not to adhere to it.

Setup Rules To Live By

If you've never set up a network before, don't let the manufacturers'

A Case Study: Installing The SOHware Wireless Network

The SOHware (<http://www.sohware.com>) wireless network comes with a typical set of components, including a \$180 gateway (in this case, it's called the B.I.G., or Broadband Internet Gateway, model NBG600), a \$250 transmitter/receiver (the CableFREE NetBlaster), and as many wireless NICs (Network Interface Cards) as there are workstations to be connected (desktop PCI (Peripheral Component Interconnect) NICs: \$190, PCMCIA (Personal Computer Memory Card International Association) NICs for notebooks: \$80). We put SOHware's network to the test by doing a complete installation of all its components ourselves, and recorded a blow-by-blow account along with a few observations:

- 1** We unpacked the B.I.G., and connected it to our DSL (Digital Subscriber Line) router. (The manual fails to note that you need to use the "crossover cable" that you're currently using with your router, not a "straight-through" network cable.)
- 2** We ran the straight-through cable from the NIC in our server to a free port on the back of the NBG600.
- 3** Next, we went into our server's Network Properties (as described in the "Setup Rules To Live By" section of the article) and entered the appropriate information from the manual.
- 3a** We needed to enter a gateway IP (Internet protocol)

address that we did not find mentioned anywhere in the manual, and which—at least in our case—did not get assigned automatically. If you're unable to connect to your ISP (Internet service provider) through the NBG600, you may need to call (or e-mail) SOHware's technical support to get the gateway address. (E-mail support@sohware.com, or call 888/785-8222.)

- 4** We connected the transmitter (the futuristic-looking NetBlaster) to an open port on the back of the NBG600, and checked the LED (light-emitting diode) indicators on the NetBlaster. They were flashing as described in the manual. We made note of the NetBlaster ID number on the bottom of the unit (you should too, you'll be needing it later).

- 5** We installed a wireless NIC card in a remote workstation (an older notebook PC) and powered it up. The operating system noted the presence of the new device and asked for the appropriate drivers.
- 6** We obliged by running the CableFREE setup utility on the workstation. The utility asked us to enter the NetBlaster ID number mentioned in step #4.
- 6a** The installation uses some standard Windows drivers in addition to its own, so make sure you either have a Windows CD-ROM handy or you know where on your hard drive such drivers are stored (they're usually in a folder in your Windows directory called \WINDOWS\OPTIONS\CABS).

ease-of-use claims fool you. Most wireless network systems are purported to work "out of the box," but our experience is that most assume the user has at least some level of familiarity with networks. While it's not nearly as complicated as it used to be, setting up a wireless network is not always completely straightforward, especially for the uninitiated. And, as with all technology systems, documentation ranges from quite good to truly terrible.

Follow the directions religiously. Don't skim the manual or skip steps just because you think you know what you're doing, and don't be afraid to call the company's help desk or to contact them via e-mail. While constructing a network for this article, SOHOware answered our questions quickly and courteously when we called (and no, we didn't tell them our evaluation would be part of a magazine article). If you

still have questions, remember the golden rule of networking: if you've never set up a network before, it pays to have a friend who has.

If you're using a high-speed Internet connection, you've probably already configured certain network settings on your PC. Before you install your wireless network, *write them down*. Installing the new network may change them, and if you ever wish to uninstall the network, you'll want to bring your system back to its original state.

To do so, click the Start button, point to Settings, and click Control Panel. In the Control Panel window, click the Network icon. Click the Configuration tab in the Network dialog box, highlight your current TCP/IP (Transmission Control Protocol/Internet Protocol) configuration, then click the Properties button. Copy down the information from the IP Address, Gateway, and DNS Configuration tabs.

Note that you may have to enter (or modify) your network settings while installing the new network anyway, so it's helpful to familiarize yourself with these settings ahead of time.

Cut The Cord

Is it time to consider a wireless network? In a word, yes. Thanks to an approved IEEE standard for wireless networking, you can count on wireless systems to behave as expected, and you can assume that equipment from one 802.11-compliant manufacturer will work with another's. If you've been putting off installing (or expanding) a network because of the considerable hassle of stringing cable and drilling through walls, it's definitely time to explore the wireless option. **II**

by Rod Scher

6b If you're installing a CableFREE card in an older computer, you may need to use an older ISA (Industry Standard Architecture) card instead of the PCI card that SOHOware normally ships. Check with SOHOware before purchasing a NIC for a workstation older than a Pentium II PC.

7 We rebooted the PC.

8 We didn't add multiple workstations, but if we had, we would have done so by repeating steps 6-8.

9 In order for the server to be able to view drives and peripherals on the workstations, and in order for the workstations to be able to access data from the server, we designated all necessary drives as "shared."

We right-clicked the Network Neighborhood icon, clicked Properties, clicked the File And Print Sharing button, and indicated which drives and printers we wished to share.

9a If you wish to have the remote workstations print to a central printer, you'll need to install that printer as a "network printer" on each workstation. You'll also need to do so on the server.

When our installation was finally complete, we tested our SOHOware network by monitoring the performance of our workstation (a 233MHz notebook PC) as we moved it around a two-story home. Much to our delight, it performed flawlessly.

The 802.11b specification requires data transmission at

speeds from 2-11Mbps. At certain distances, the spec allows that to fall to 1Mbps. In no case did our throughput fall much below 2Mbps. Additionally, the signal strength of the unit never fell below 97%, even when we took the laptop outside and asked it to communicate with the NetBlaster located in the basement.

You can check the speed of an Internet connection by "pinging" a server, or sending a series of trial data packets to it, and measuring how long (in milliseconds) it takes the packets to reach and return from their destination. Using that technique, the CableFREE-equipped remote workstation averaged perfectly respectable 125-127ms ping times, with no packet loss whatsoever. This com-

pares favorably with the 110-112ms ping times we generated when pinging the same server through a direct DSL connection.

We were able to access data files residing on the server in the basement from anywhere in the building with no appreciable lag time. Printing a word processor document on the basement printer was also no problem, and printing didn't seem to take any longer to initiate from the remote station than it did from the server itself. Finally, we found that although Video for Windows and QuickTime movie files looked noticeably choppy when streaming across the network, MP3 and WAV audio files made it through the air to our remote workstation with no problems. **II**

Fix Your Startup Files

Fire Up Your Text Editor

THE WINDOWS 98 REGISTRY is the most well known of the startup files, but it's not the only file that you need to keep in proper shape. Win98 still uses four files inherited from the classic DOS (Disk Operating System) and Windows 3.1 era to set up your system's hardware and software configuration: Autoexec.bat, Config.sys, Win.ini, and System.ini.

If you haven't seen the contents of these files lately, don't be surprised; most of us spend very little time with them. When we install new hardware or software or need to change the normal operation of our system, we may need to change these files. Although setup programs normally edit the files for you, damaged or incorrectly edited files will cause you big problems. This article shows you how to fix these files and ensure that they work correctly.

Because all four of these files are plain text, you can use any text editor, including Notepad in Windows or the Edit command in DOS. However, Win98 provides a superior choice for both editing startup files and troubleshooting problems: Msconfig, the Microsoft System Configuration Utility.

To start Msconfig, click Start and Run, type msconfig, and press ENTER or click OK.

Once the System Configuration Utility box opens, you can view any of the previously mentioned files and do the following: remove a command, temporarily bypass a command at next boot for troubleshooting purposes,

and edit a command. For more information about Msconfig, use its Help menu.

Config.sys

The Config.sys file, despite its name, is a plain-text file. It's designed to perform the following tasks in Windows 98: Load device drivers for devices that are not supported by the 32-bit drivers in Windows, such as older CD-ROM drives; provide memory management features for DOS programs running under Windows with Emm386.exe (a device driver that ensures you can use all of your system's memory) if necessary; and override other default Win98 settings.

In many cases, a Win98 computer may have an empty Config.sys file because most users don't need to override Win98 defaults or install drivers for older devices. However, if your computer previously ran an older version of Windows, or if you run a lot of DOS programs, you'll use this file.

Problems with Config.sys include the following:

- **Misspelled commands.** Win98 is no better at guessing a command's correct spelling than any other operating system. If you get an error message, such as *Unrecognized Command In Config.sys Line X*, you may need to correct a spelling error.
- **References to nonexistent files.** If Config.sys has a reference to a file that doesn't exist, you'll see a *Bad Or Missing Filename* error message, which can also result from a misspelled file name.
- **Using long file or folder names.** Because Config.sys is run before the Win98 GUI (graphical user interface) is on-screen, you must use the DOS alias name for any folder or file you reference in Config.sys.
- **Putting commands into Config.sys that belong elsewhere.** If you are trying to set up Config.sys manually and you need to edit Autoexec.bat, as well, make sure you don't get mixed up. Config.sys and Autoexec.bat use completely different commands.

The Config.sys graphic (on the next page) shows errors and their solutions:

1. Win98 normally loads Himem.sys, which creates XMS (extended memory specification) memory, from the Registry. However, if you want to load it manually, you must use the correct folder. It is located in C:\WINDOWS, not C:\.
2. DOS=HIGH, UMB (upper memory block) is used if you want to want to use the Emm386.exe memory manager. UMB is misspelled and will not be recognized as a command by Win98.



3. DEVICE= is correct; DEISE= is spelled incorrectly, and the CD-ROM driver referenced is stored in a folder with a long file/folder name. Refer to long filenames with their DOS aliases: The alias for the C:\Cdrom Driver folder is C:\CDROMD-1.

4. Another misspelling: RUM for REM. REM, short for REMARK, indicates a line of text as opposed to a command. The PC ignores REM lines.

5. Reference to a nonexistent command; the Emm386 memory manager is called Emm386.exe, not Emm386.sys.

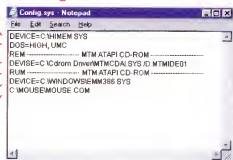
6. Mouse.com. If you need to use it to run a mouse before Windows starts, Mouse.com belongs in Autoexec.bat, not Config.sys. Remove it.

Add commands to Config.sys only if they are needed for hardware that can't be run with 32-bit Windows drivers or to change the defaults Windows uses. If you have to make any changes to Config.sys, make sure they are absolutely necessary and that they refer to commands, files, and folders that exist.

Autoexec.bat

The Autoexec.bat is also a plain-text configuration file that performs tasks similar to those performed by Config.sys. It also modifies the defaults used by Win98 to start the system, but Autoexec.bat differs in significant ways.

Wrong



- Add commands. You can manually enter Autoexec.bat commands at the command prompt; adding them to Autoexec.bat is a convenience.
- Watch the order. The order of statements in Autoexec.bat is important; unlike Config.sys, the first line in Autoexec.bat is processed before the others.
- Windows does use Autoexec.bat. Autoexec.bat is used by many Windows programs that must set options before startup with SET commands. You won't find Autoexec.bat empty as often as Config.sys.

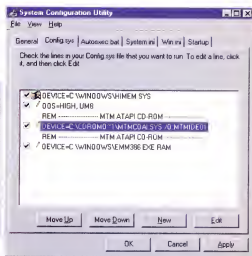
Some of the errors you may make with Autoexec.bat are similar to those you can make with Config.sys, including the following:

- Misspelled commands. Win98 is no better at guessing the correct spelling for a command than other systems. If you get an error message,

such as Unrecognized Command In Autoexec.bat Line X, you may have a spelling error to correct.

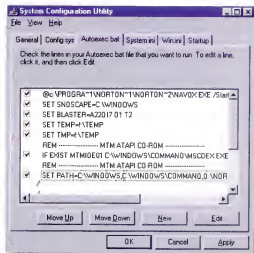
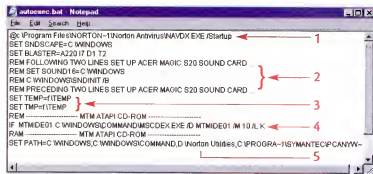
- References to nonexistent files or folders. If Autoexec.bat has a reference to a file that doesn't exist, you will see a Bad Or Missing Filename error message, which can also be caused by misspelling the file or folder name.
- Using long file or folder names. Because Autoexec.bat is run before the Win98 GUI is on-screen, use the DOS alias name for any folder or file reference in Autoexec.bat.
- Putting commands in Autoexec.bat that belong somewhere else. If you're trying to set up Autoexec.bat manually and you need to make changes to Config.sys, as well, don't get mixed up. Autoexec.bat and Config.sys use completely different commands.

Right



Right

Wrong



The Autoexec.bat graphic on the previous page shows typical errors and their solutions.

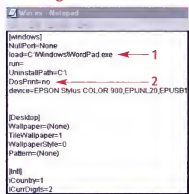
1. You can't use long file and folder names in Autoexec.bat. To find out the correct DOS alias for the Norton AntiVirus folder, open Windows Explorer, right-click the folder, and select Properties. The DOS name for the folder is displayed below the folder size and contents information.
2. This isn't a big problem because the REM statements prevent these lines from being processed, but they aren't doing you any good unless you plan to use the sound card at a DOS prompt. If this card is no longer installed, delete these lines from Autoexec.bat.
3. This looks like a mistake, but it's not if you've created the F:\TEMP folder. Some programs use SET TEMP and older ones use SET TMP to set the location for Temporary files. If you want to use a different drive or folder, make sure you select a hard drive and make the folder with the Windows Explorer before changing Autoexec.bat and restarting your PC.
4. This is an incorrect command; the command is supposed to be IF EXIST MTMIDE01 ...; it loads the MSCDEX CD-ROM driver only if the Config.sys device driver has been loaded first.
5. Another long folder name problem that should be changed as in step #1 that we mentioned earlier.

Win.ini

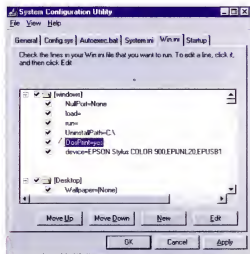
The Win.ini file is used to control some of the visible parts of Win98, although in more recent versions of Windows, the Windows Registry does most of its work. Win.ini was kept around after Win3.1 was replaced by Windows 95 and Win98 because it allows older applications that need Win.ini to function to keep on working, but some of its features can cause problems if they're not used correctly.

Win.ini is divided into different sections. If you view Win.ini with the

Wrong



Right



Mscconfig program, each section is displayed as a folder; click the plus sign next to the folder to display each statement in the section. If you view Win.ini in a text editor, such as Notepad, each section is headed with its title in brackets, such as [Windows].

Fixing problems with the Win.ini file can be very challenging because the "right" way to fix a problem could be buried in a setup program, the Windows Control Panel, or any number of other places.

Typical problems with Win.ini include the following:

- Incorrect use the load= and run= statements in the [Windows] section. If you want to run a Windows program automatically when you start Windows, use the Windows Explorer to add it to your Startup group.
- Missing or incorrect extensions in the [Extensions] section. This section is used to specify which program is used as the default editor for a particular file type. If you just erase a program instead of uninstalling it, these statements will remain behind.
- Using long file and folder names. Because Win.ini is processed before the Win98 GUI starts, all file and folder references must use the DOS names just as in the Config.sys and Autoexec.bat files.
- Incorrect syntax for some commands. Win.ini uses 0, No, or False to disable or turn off an option, and 1, Yes, or True to enable or turn on an option. Use the correct value for each command or it won't work.

- Misspelled statements will cause Windows startup errors. As with the other files, if you misspell an command, Win.ini cannot process it.
- Watch for semicolons. Using a semicolon (;) in front of any line is the equivalent of using REM for the Autoexec.bat or Config.sys files; Windows will ignore this line of text.

In the graphic above we've shown some of the typical Win.ini errors you may encounter and their solutions.

1. Don't use load= or run= to start programs when you start Windows; remove these statements from Win.ini and add the programs to the STARTUP folder in the Windows Explorer.
2. If you want to print from a DOS program under Windows but the DosPrint is set to No, you will not be able to do so until you set this to Yes.
3. Long file and folder names (not shown) don't work; Win.ini sees C:\PROGRAM FILES as simply C:\PROGRAM. It will not find the Paint program when you want to open a .BMP file.
4. These file associations shown below belong to a program that's no longer on the system; remove them.





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VAIO

Online Payment Systems

Parting With Cash Is Never Sweet, But It's Getting Easier



NOW THAT WE'VE ALL HAD A LITTLE TIME to pay down those holiday bills, it might be time to do a little spring shopping. Perhaps you're looking to brighten up your home or maybe upgrade your computer system. Imagine walking into your local department store or electronics store and being told the store no longer accepts cash or checks, just credit cards. Not only that, but in order to complete the transaction you have to fill out a lengthy form with your name, address, phone number, credit card number, and e-mail address. Every time you return to the store, the same lengthy form confronts you.

Granted, the above scenario would never happen at your local department store, but anyone who has ever shopped online probably recognizes the story. Credit cards are a popular way to pay for goods and services online, but such a prerequisite excludes buyers without a credit card from online commerce. Even if you have the plastic, placing an order online usually means filling out a lengthy order form.

Naturally, online businesses want to make things as easy as possible for online customers. Some businesses have developed their own solutions. Amazon.com's 1-Click shopping, for instance, lets users skip those lengthy forms. Other businesses provide digital wallets that attempt to fill out forms automatically on a variety of Web sites.

A number of payment solutions have also sprung up around online auction sites such as eBay. Credit card processing services let sellers accept credit card payments, and some companies not only let buyers pay by credit card, but also provide escrow services to protect both the buyer and seller. Other services forego credit cards completely in favor of other payment systems that don't require a credit card.

Fewer Forms

No one likes filling out forms, but filling out the same form over and over is even worse. Many online sites have taken it upon themselves to reduce the amount of virtual paper work they require from their customers. Amazon.com (<http://www.amazon.com>), for instance, provides its patented 1-Click shopping service for frequent customers.

Amazon's 1-Click shopping service lets you enter a name and shipping address along with payment preferences. Amazon keeps this information on its systems until it's needed. You can even specify multiple names and addresses so you can send a gift to someone you know with just one click. To place an order, simply find the product you want to order and click the name associated with the address where the package should be sent.

Barnes & Noble.com (<http://www.barnesandnoble.com>) provides a similar service with its Express Checkout. When you register for the service, you must provide at least one shipping address and a credit card number. Because Amazon.com holds a patent on its 1-Click shopping service, Barnes & Noble.com's Express Checkout requires two clicks: one to order the product and one to confirm the order. Regardless of how many times you have to click, the idea is the same: less busywork for the customer.

Along the same lines of reducing busywork, other companies are producing similar services they call digital wallets (databases that store a users' account information). Unlike shopping services at a particular Web site, digital wallets are designed to work with a variety of sites. Microsoft, for instance, uses its Passport service (<http://www.passport.com>) to store personal information, including name, credit card, and address. If you

shop at one of MSN's partner sites, you can use your Passport information to bypass the long forms. Other digital wallets include Novell's DigitalMe (<http://www.digitalme.com>) and Yodlee.com (<http://www.yodlee.com>).

All of the above services work in a similar manner. A company keeps your personal information on its server and intercepts online payment forms and sends them to your digital wallet service. The service adds the necessary information for you and lets you submit the form quickly. Although digital wallets are designed to work with a variety of Web sites, many compatibility problems still exist.

There are also privacy concerns associated with digital wallets. Companies that provide these services not only have your personal information, but they also may keep track of what you buy online. Many sites have a privacy policy, and in most cases companies say they use your information to provide you with anonymous targeted advertising. This means that although you may see targeted ads on your PC, you're unlikely to get telemarketing calls or junk mail (or at least telemarketing calls and junk mail resulting from your use of a digital wallet to place an order). Of course, privacy policies can change suddenly and without notice.

Credit Where Credit Is Due

Nearly every online site accepts credit cards, and in most cases, credit cards are the best way to do business online. Many credit cards offer protection against unauthorized charges, so even if your credit information is compromised, it's unlikely you'll be held responsible for any resulting purchases. In addition, you have the right to dispute items charged to your account. This can be a powerful tool if you order something that never arrives and can't get a refund.

If you're still worried about compromising your account by using it to



single-use card numbers for maximum security

You can shop online with a randomly generated account number from Discover's deskshop rather than disclosing credit card information every time you shop.

shop on the Internet, American Express and Discover Card are offering a new online service for card members. Private Payments from American Express and deskshop from Discover Card let cardholders use a randomly generated account number that's linked to a real account number. You can use the randomly generated account number to order goods online. The number is only good once, so if the number is stolen, it won't do the thief any good.

These services don't work in every situation, however. Recurring charges, such as monthly Internet service charges or subscriptions to Web sites will not renew correctly unless you use your actual account number. If you purchase items that you must pick up in person, such as airline tickets, you may be asked to present the card you placed the order on. Once again, you'll have to use your actual account number when placing the order.

Online Auctions

Although credit card payments work well enough when you're dealing with an established online retailer, online auctions present a few problems. Many sellers who participate in online auctions lack the means to accept credit card payments.

Credit card processing services. The ability to accept electronic payments is

important in an online auction because it can greatly increase the amount of time needed to close an auction. Instead of waiting for a check to clear, a buyer can send an electronic payment and the seller can ship the product almost immediately. One of the most popular online auction sites, eBay (<http://www.ebay.com>), has partnered with Billpoint (<http://www.billpoint.com>) to allow buyers to accept payments via credit card. Other online auction sites, such as Yahoo! Auctions (<http://list.auctions.yahoo.com>), have similar services.

In order to use Billpoint, both the buyer and seller must register with Billpoint. Once registered, the buyer can pay for items won at auction with either a credit card or an electronic check. Billpoint provides two types of seller accounts that depend primarily on sales volume. The Merchant Account provides for slightly lower fees while the Standard Account lets anyone accept credit card transactions, but with increased service fees. For sales that are less than \$15, Billpoint charges a minimum fee of 35 cents. For sales of \$15 or more, Billpoint charges 1.75% on Merchant Accounts and 2.5% on Standard accounts in addition to the 35-cent base fee. Merchant and Standard accounts limit transactions to \$2,000 and \$500, respectively. If the buyer pays through Billpoint using an electronic check, there are no transaction fees, but Billpoint imposes a \$200 transaction limit on all accounts. The seller must pay all fees and cannot pass fees on to the buyer.

Billpoint doesn't just provide services for online auctions, it also lets registered users send invoices and receive electronic payments from anyone. This means you could conceivably use the Billpoint service in conjunction with any online auction site, although it's most tightly integrated with eBay.

Yahoo! offers a similar service known as Yahoo! PayDirect. This service lets you transfer funds electronically but

requires that you fund a separate account rather than charge items directly to a credit card. There are no fees associated with Yahoo! PayDirect.

Online Escrow Services

If you've ever sold or bought real estate, you're familiar with escrow services. Online escrow services hold payment while the buyer reviews the merchandise. If the buyer is satisfied with the purchase, they authorize payment, and the transaction is complete.

In most cases, the buyer and seller must agree on the following before entering escrow: who will pay for shipping and handling, who will pay the escrow fee, and how many days the buyer has to evaluate the product. Escrow services often accept credit card payments from the buyer. This speeds up the entire process and lets the buyer pay immediately so that the seller can ship the goods quickly after the auction closes.

All merchandise must be shipped through an approved carrier. In most cases, this means a carrier, such as UPS or FedEx, that provides a tracking number. The seller gives the tracking number to the escrow service so it can be sure the buyer receives the merchandise. After delivery, the buyer has a predetermined time to review the unit. If the merchandise is not what the buyer expected, he can request a refund. Some escrow services charge escrow fees and shipping and handling to the buyer if he returns an item regardless of previous agreements between the buyer and the seller. This practice helps discourage frivolous returns. The escrow service pays the seller at the end of the review period or when the buyer gives his OK.

Like Billpoint, i-Escrow (<http://www.iescrow.com>) is tightly integrated with eBay auctions. The i-Escrow service lets eBay buyers and

sellers quickly and easily register for the service from eBay. You can use an online escrow service with any auction or even with trades that may take place outside of an auction. Charges are usually based on the price of the merchandise. For instance, i-Escrow charges a base fee of \$2.50 for all transactions of \$100 or less. Transactions between \$100 and \$25,000 are charged 2% for cash payments and 4% for credit card payments.

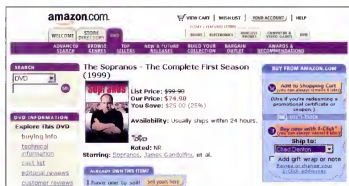
Although online escrow services act as a third party to oversee Internet transactions, there is no third party to oversee the escrow services. Traditional escrow services must be licensed and are subject to regular audits, but

California officials had not received one compliant regarding an online escrow service. Still, if you're going to assume the added expense of using an escrow service, you might want to consider using a licensed service.

Micropayments

Merchants are charged processing fees for all credit card transactions, which make credit cards impractical when paying for low-priced items. Micropayments (usually considered a transaction that could range from 1 cent to \$15) avoid the heavy transaction fees associated with credit cards and make it economically feasible to charge fractions of a cent.

Although the Internet has long been a free, ad-supported domain, there are people who believe micropayments could provide a viable revenue stream for many content sites such as Yahoo! or ABC News. Art Feierman, founding partner of Presenting Solutions, has followed micropayments for years. Presenting Solutions sells projectors and presentation equipment, but it also provides



Amazon.com lets you keep shipping and payment information on file. Amazon.com uses this information to help you avoid filling out forms when you purchase something using its 1-Click shopping method.

many online escrow services are unlicensed. In January 2000, California started forcing online escrow services doing business in California to be licensed in the same manner as traditional escrow services. As a result, California sent warnings to online escrow services that conduct business in or with residents of California. Rather than obtain a license, many online escrow services have put disclaimers on their sites stating that they could not do business with consumers who live in California.

Some online escrow services, however, have either obtained or applied for a license. Escrow.com (<http://www.escrow.com>) and i-Escrow are licensed with the California Department of Corporations. As of December 2000,

communication-related articles accessible through micropayments. Feierman says micropayments could be a viable option for content sites that find it increasingly difficult to make a profit from advertising alone.

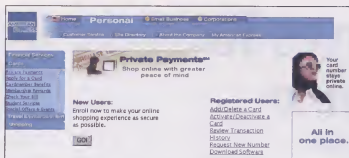
Feierman says the potential revenue stream for content sites could be large. "I believe that you will see over the next year or so, micropayments create a new revenue stream for content sites. Instead of relying on selling banners, they can generate even more money, or as much money, selling the content at incredibly low costs, says Feierman." According to Nielson/NetRatings, Yahoo! had 25,541,786 unique users in December 2000. If Yahoo! had charged every visitor that month 1 cent, it could have generated \$255,417.86, or

more than a quarter of a million dollars, in revenue. When you consider that this figure doesn't account for repeat visitors, you can see the kind of revenue potential inherent in micropayments. Micropayments may also play a key part in enabling low cost digital music downloads by providing an economical system that allows the content providers (music companies in this case) to sell digital music for a very low price.

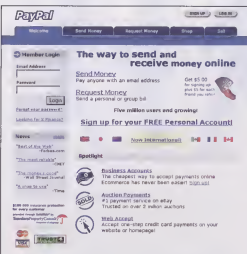
Micropayments have been slow to make it to market for a variety of reasons. One of the biggest reasons is the lack of common support. Much like digital wallets, micropayment systems are not necessarily compatible with one another. As a result, consumers don't want to open an account with a micropayment service because none of the available services have an overwhelming number of partners that support their service. Likewise, Web sites aren't eager to partner with a service because none of them have a large number of user accounts.

Another problem is that the Web is an international medium and currency is not. When Compaq bought Digital Computer, it also bought the rights to Digital's micropayment system, MilliCents. Since the Digital acquisition, Compaq has rolled out MilliCent service in Japan and is planning a North American rollout sometime in the near future. MilliCent will be able to calculate exchange rates, making it possible for users around the world to use MilliCent's service to buy goods or pay for content.

Some critics also point to the fact that a micropayment service is also going to have to provide expensive customer support. Feierman agrees that support is important but says that the number of customer complaints is not likely to be very large



American Express' Private Payments service generates a random account number each time a cardholder makes an online purchase. This method helps keep the user's actual card number secure.



PayPal lets you e-mail money to friends and family (or pay for items you purchase in online auctions) without having to disclose your credit card number.

when dealing with amounts as small as 1 cent. "Do you think anyone is going to spend the time to call up to say, 'I don't think this is correct, you need to give me a credit for 2 1/2 cents.' Life is too short."

Other Peer-To-Peer Models

Peer-to-peer payment is the fastest growing Internet payment model. Yahoo!'s PayDirect is one example of a peer-to-peer payment model where users fund a separate account and then e-mail payments. One of the most popular sites in this area is PayPal (<http://www.paypal.com>).

PayPal offers a number of services for both businesses and consumers, but at its heart, PayPal lets users send

and receive money from other users. Users can sign up for a Premier or a Personal account. Personal accounts are free, and Premier accounts charge a fee of up to 1.9% plus 30 cents on all incoming transactions (there is no charge if you want to send money). Premier accounts have a few extra features, including customer service and special

promotions. Premiere account users can also transfer funds to their primary bank account daily.

Using PayPal to send or receive payment on an auction is a simple matter of sending payment or a request for payment to the sender and then waiting to receive payment. You can withdraw funds from your PayPal account any time.

At press time, PayPal was planning to introduce PayPal Shops, a directory of online retailers that accept PayPal payments.

Attractive Options

New online payment options are not just making it easier to purchase items online, they are also opening new revenue streams and letting users complete transactions with one another faster and more securely. With digital wallet services, purchasing online can be as easy as swiping your credit card at the local grocery store. Internet escrow services not only provide an easy way to pay for auction purchases but also help protect the buyer and seller. Peer-to-peer payment services, such as PayPal, let customers pay one another quickly and easily. Perhaps in the near future, purchasing items online will be as easy as purchasing items at your local retail outlet. Now, all we need is a faster delivery mechanism. ■

by Chad Denton

Join Forces To Buy Online

There's Power In Numbers



AS JOHN LENNON ONCE SAID, "Power to the people; power to the people, right on!" You've heard all the talk about the power of the Internet. How would you like to see it in action? A new breed of Web merchant, known as a group buying site, lets you. Through these sites, you can team up with other bargain-conscious shoppers to buy an item in bulk at cheaper prices. The more buyers, the lower the final price—or at least that's the theory.

Like everything else prowling around the wild frontiers of the Web, simply signing up with a group buying site doesn't guarantee you'll get the best price or even the merchandise you want. Just like traditional online shopping, you'll face the same challenges (or nightmares) of searching for items, comparing prices, selecting a seller, and discovering you've paid too much or that the ordered item is either out-of-stock or has been discontinued.

Bottom line: You will be able to team up with other consumers or small business buyers to net discounts similar to those enjoyed by large companies and corporations; however,

there are risks. Group buying sites are new and the market is volatile; several sites have gone belly-up or have gone back to the drawing board and changed business strategies, moving away from servicing consumers to the more lucrative business-to-business model.

If that wasn't enough, in addition to navigating through different sites offering different products, you'll need to be aware of an entirely new set of rules and hidden catches in prices, ordering, and service policies.

Sound complicated? It can be *unless* you know what you're doing. To help you snag the best deals, we'll show you how these group buying sites work, explain how to get the best deals, and even recommend some of the best places to start shopping. By the time you finish this article, you'll know how to make even the toughest group buying site an offer it can't refuse.

Power To The People

In the offline world, consumers are familiar with deals, such as buying in bulk and volume discounts. Chances

are you've made a purchase through a price club, co-op, or credit union, or maybe you've simply watched Betty Rubble and Wilma Flintstone join forces to, "Charge it!"

We'll navigate group shopping sites, such as Etrana (<http://www.etrana.com>), Volumebuy (<http://www.volumebuy.com>), Shop2gether.com (<http://edu.shop2gether.com>), and BazaarE.com (<http://usa.bazaare.com>). Sites such as PointSpeed (<http://www.pointspeed.com>) and PeoplePC (<http://www.peoplepc.com>) are trickier because they take the group buying concept a bit further. However, if you've ever participated in an online auction on eBay (<http://www.ebay.com>); used a name-your-price site, such as priceline.com (<http://www.priceline.com>); or even sent out shopping bots (short for robot, these agents are usually software programmed to automatically scour the Web for information or to execute some function), such as MySimon (<http://www.mysimon.com>) to prowls the Web in search of digital discounts, then you're well on your way to knowing how these sites work.

Group buying sites, in fact, are like online auctions in reverse. They are designed for shoppers who are looking to buy the same item. The more people who want to buy the item, the greater the discount.

Like online auctions, the sites offer new products every day that are available for a limited time. The time a product is available (several hours, days, or weeks) is called a purchase or buying cycle. The number of people who enter the same cycle determines the final price of the item.

How do you know what products are available? Group buying sites operate on two models. The most common, called a seller-initiated sale, is where a seller offers a list of products for group purchase. The seller tells the buyer up front how much the product is and how many buyers are needed to drive the price down. BazaarE.com calls this a Featured Group, and generally, there are several

price dips associated with the number of buyers who join the offers.

For example, a \$300 digital camera might begin a buying cycle at \$275. Remember: This is not necessarily the price you'll pay, but rather the most you can expect to pay. As other buyers commit, say eight of them, the price drops to \$265; at 25 it dips to \$250; and at 50 it drops to \$225. All discounts may not be this dramatic, but the more expensive the item, the greater the incremental saving.

If you don't like the items in this model, tough! Luckily, there's an alternative: group buying sites driven by a consumer-initiated model. Similar to a name-your-price site, in a consumer-initiated sale, you create a listing for a desired item. You tell merchants what you need and what you're willing to pay, and you estimate how many buyers

will join the group. Bazaare.com calls this method a Buy'in Group, and its merchants, primarily small and midsize retail stores, review proposals and bid on the business, make a counter offer, or just say no.

How It Works

Before you get started, understand group buying sites are not for everybody. In fact, if you're in hurry to buy an item or too busy to do the research, you'll get faster results buying retail or using a shopping bot, especially for generic products, such as the latest version of Quicken or Grisham thriller.

You'll also get faster results from event buyer-driven sites, such as eWanted.com (<http://www.ewanted.com>), iWant.com (<http://www.iwant.com>), or Respond.com (<http://www.respond.com>), where shoppers describe exactly what they're looking for and how much they're willing to pay. Registered dealers, stores, or individual sellers read the requests, and if they have a match, they contact you through anonymously rerouted e-mail.

By their nature, group buying sites take longer to complete a transaction because the same concept that drives down the price, attracting other Internet buyers, slows down the process because you have to wait for a certain amount of people to commit to a sale. Volumebuy's Group Power Pool works this way: If the required number of pool participants is not reached by a certain time, the pool

many buyers are needed to secure additional discounts. Some sites let you talk directly to group members or leave messages on a forum.

Who's responsible. As with any online transaction, read the fine print. Shipping charges, sales tax, return policies, warranties, and other sale vagaries vary by product and merchant. Beware of sites that factor these and other hidden costs into the final pricing and leave it to the buyer to do the math. Every merchant has its own rules and restrictions that significantly affect the final price.

Trust but verify. Don't assume you can return an item but make sure you know who to contact in case there are any problems (delivery or product performance) before you order. Whenever possible, find out who manufactures the product you're interested in and check that

company's Web site for product information, warranty, and return policies.

Don't do the sign, if you can't buy the find. Just like bidding at an auction site or making an offer to price-line.com, once you've entered a group and submitted your information, you're committed to buying the item. If no buyers join the group, you're stuck buying the item at the price you agreed to when you signed in.

Cut and run. Most group buying sites earn money from the seller through commissions ranging from 3% to 10%. In other words, there's no charge to buyers. A reputable site will never ask for any up-front fees. If a site does, run.

Tips For Snagging Group Deals

You may have to do a little finagling to make sure you end up with the product of your dreams at the best price. Don't make a bid, join a group, or do anything that commits you before checking pricing and availability. If a shopping bot can't find an item, there's a good chance it's out of stock or



Group buying sites, such as Bazaare, let you team up with other consumers or small-business buyers to net discounts similar to those enjoyed by large companies and corporations.

expires, and the product is not shipped. At most sites, going through the bidding process can take days or weeks, and there's no guarantee that a group will fill up or that the final price will be slashed. Here are a few guidelines to get you started.

Look before you click. Scope out a couple of group buying sites before making a commitment. Most let you look around; however, their goal is to get you to sign up so at some point you'll be diverted to a registration screen requesting requisite personal information, user name, and password. When you find something you want, be prepared to fill out more forms, including billing and shipping information. If you have any questions or security concerns, read the site's privacy statements.

The devil's in the details. Before bidding, see if the site offers product specifications. Be prepared for everything ranging from bare-bones name and model number to in-depth reviews. At the very least, you should see when the buying cycle starts and ends, how many buyers have joined the group, and how

discontinued. Granted, the Web makes it easy to research and buy an item, but it also makes it easy to overpay.

There's strength in numbers, and you're practically guaranteed a lower price if you enter a group, or form your own, with people in tow. E-mail friends and ask around. Chances are you belong to something or know a group of people with whom you share similar tastes. Invite them to join, too.

Take advantage of promotional tools. For example, BazaarE.com lets you e-mail friends. At Volumebuy, you can subscribe to a free weekly e-newsletter to keep tabs on hot deals. Other sites offer additional discounts if you promote the group purchase, saving you even more.

Some sites have features similar to auction bids, whereby you're notified by e-mail when a buying cycle is about to close. Others let you preset or reserve a price when you sign up for a sale. If the price of the item drops to the price you've selected, you're automatically entered into the group and charged for the item. If the price doesn't drop, you've risked nothing. Again, tools vary from site to site and new features are regularly added so look around to see what's available.

If you're looking for a Batman wall clock, check out a local flea market or auction site. You'll have better results looking for top-selling products, such as digital cameras, DVD players, CDs, computer software, and accessories, from brand-name manufacturers.

Like auction sites, group buying sites have deadlines. Unlike auction sites, group buying sites may close well before the actual deadline date if the maximum number of bidders sign up. If you wait too long to join, it may be too late. If the site doesn't have a reminder service, check back frequently.

It's easy to get caught up in the group buying madness, especially for a small business looking to cut corners. Avoid buying fancy-schmancy gadgets you don't really need.

Some deals are too good to be true and may never come around again. If you see an item you really want, bid on it.

Is There A Group Site In Your Future?

Two years ago when the first wave of group buying sites hit the Web, industry analysts heralded them as the new Internet gold rush. Microsoft co-founder Paul Allen led the charge with Mercata. Financed with \$89 million in venture capital, Mercata helped consumers secure bulk-buying discounts from manufacturers.

Other merchants, such as ActBig.com (later Etrana.com), Accompany.com, and MobShop.com soon followed. Even AOL and Yahoo! tested the waters. The market seemed prime for a group buying site explosion but instead of revolution, came evolution.

In March 2000, Accompany.com changed its name to MobShop.com and in addition to hosting a group buying Web site that specialized in computer hardware, DVD movies,

pulled a similar business-to-business model switch.

Suddenly AOL and Yahoo! stopped talking about group buying launches. Other group buying sites stopped selling direct and started licensing technology to other business-to-business sites.

For example, PointSpeed now teams up with "featured partners," such as AT&T: Small Business Center, Wells Fargo, and Concentric Network. You start at the PointSpeed site, click one of the partner's icons, and "gateway" into that partner's special purchasing department, offering selected items supposedly at a group discount. There's no bidding; there are no other buyers to contend with; and in most cases, there's not much of a savings. Using MySimon, we found a Palm IIIc Color, selling for \$322.42 at Well's Fargo's Online Purchasing, for \$30 to \$50 less at several Web merchants.

Still, the biggest blows to the continued growth and success of the group buying concept came early this year, when Mercata.com, the most widely known group buying site, closed its cyber doors. Shortly after, MobShop closed its consumer operations, but it continues to offer group buying services in the business-to-business arena. The "United we buy, together we save," concept also hasn't helped MultiBuyer.com (<http://www.multipayer.com>), which is closed indefinitely while making "improvements to the site."

"Whether the group buying concept will survive for individual consumers remains to be seen," says Dan Infanti, chief marketing officer of Etrana. "It will take some time and adjustment, but in the end the Web merchants will continue to find ways to buyers with dollars."

In the meantime, start with the sites listed in this article. Remember: There are deals and bargains as long as you are careful. ■

by Michael Cahlin

Time Power Pool™
When you enter a Time Power Pool, Volumebuy will sell you a product or service at a guaranteed discounted price based on the length of your buying pool. The buying pool you enter has no price fluctuation and Volumebuy guarantees the discount regardless of how many buyers enter the pool. Your pool period begins at the time of entry.

Example: Buy a 300 Watt Power Pool
This will power a portable light system and stereo up to 50 minutes of your favorite digital quality music.

Then if you enter a one month buying pool, you will receive the maximum discount. The discount is greater for the longer period of time because you have given Volumebuy the time it needs to increase the amount of buyers in the pool and obtain a greater volume discount. Your order will be processed at the closing of your pool and Volumebuy always reserves the right to close the pool and deliver the product early.

Before entering a group, make sure you know when the buying cycle starts and ends, how many buyers have joined the group, and how many buyers are needed to secure additional discounts.

electronics, games, and PDAs (personal digital assistants), the company offered its group buying software model to other business-to-business sites. Soon afterwards, ActBig.com changed its name to Etrana.com and



"Everybody :)"

With a Fujifilm digital camera, it has never been easier to capture, edit, download, e-mail and print out the smiles in your life. From the new, revolutionary FinePix 4700zoom and 40i to the easy-to-use, point and click simplicity of the FinePix 1400, Fujifilm has just the digital camera you're looking for. Get the picture. With a Fujifilm digital camera. For information on prints, cameras, printers and on-line picture uploading and downloading, call 1-800-800-FUJI or visit www.fujifilm.com



 **FUJIFILM** digital
Get the picture

Compiled by Chad Denton

A Taxing Season

The Digital Daily

<http://www.irs.gov>

The Digital Daily is the IRS' (Internal Revenue Service) electronic newsletter. Just below the surface of this newsletter, however, are several useful features. For instance, you can download instructions and forms from the Internet or find a list of companies that offer online e-filing, or electronic filing. Answers to common questions concerning e-filing in particular and tax questions in general are also available directly from the source. If you're a first time taxpayer, you might want to look over the TAX Interactive site for more basic information on taxes, filing a return, and other important tax information.

Quicken.com Taxes

<http://www.quicken.com/taxes>

Everyone has questions when it comes tax time, and Quicken.com Taxes has plenty of answers and advice. You'll find articles that provide helpful tips on everything from maximizing your deductions to tax planning strategies and advice for investors. Various calculators can help provide you with more personal answers. For instance, you can figure an estimate for your return, decide whether it makes sense to hold on to those stocks, and find often overlooked deductions. You can also file electronically online or buy Quicken's TurboTax software.

e1040.com

<http://www.e1040.com>

This site offers the best of both worlds. For users who want to fill out and file their own taxes online, you can use e1040.com's automated return service for a small fee. If you'd rather have the security of knowing a

professional is overseeing your return, you can pay a little more for the company's Live Preparer service. Simply plug your tax information into the tax organizer and submit it to e1040.com. If you submit your tax organizer during normal business hours, you can expect a call from an e1040.com tax professional within a half an hour so that they can schedule a time to speak with you about your return. e1040.com faxes, e-mails, or mails the forms to you that require a signature, and it sends completed forms by e-mail or standard mail.

Tax Prophet

<http://www.taxprophet.com>

Most of us would just as soon have a tooth pulled than try to figure out the intricacies of tax codes. Others take pride in knowing the ins and outs of the tax codes. Attorney Robert L. Sommers has more than a passing interest in the tax code. Sommer's site, the Tax Prophet, is a great source for information, especially if you're not as familiar with the tax code as Mr. Sommers. You'll find articles that analyze the latest tax news and changes, as well as tips for the upcoming tax season. For instance, if you are looking for information to help you plan for those upcoming stock options, this site can help. You will also find invaluable information about trust and tax scams on the site's Trust And Tax Scam Bulletin Board.

Nolo.com's Taxes & Audits

http://www.nolo.com/encyclopedia/tax_ency.html

Nolo.com's Web site aims to provide legal information (not advice, for



that see a lawyer) to those of us with the dullest of legal minds. Its Taxes & Audits section provides legal information concerning taxes and the dreaded audit. You can find information on the structure of the IRS, advice on how long to hold on to those old tax forms, and legal information about dealing with audits and other tax problems. The Audit FAQ has extremely useful answers to common questions you might have if you're unlucky enough to receive an audit from the IRS.

TaxPlanet

<http://www.taxplanet.com>

If you have any questions when you're filing your return or if you simply want some place to turn for the latest tax-related news, TaxPlanet is the Web site for you. The site includes a Tax Season Guide that is replete with information on the latest changes to the tax code, and it also provides hints and tips for using those changes to your advantage. You'll also find definitions and explanations of different tax related terms. Additional sections include tax tips, a tax calendar, and a section covering pending legislation in Congress. The Year-Round Tax Guide also contains several tips and feature articles that taxpayers can use any time of the year.

Quick Fixes

Most software can benefit from a few updates, patches, and add-ons downloaded from the Internet. This month we focus on software updates for PDA users.

Palm Desktop 4.0

<http://www.palm.com/software/desktop>

You can download the latest version of the Palm Desktop free from Palm's Web site. Desktop 4 includes a new user interface and a handful of features including desktop alarms and the ability to mask, or hide, data for added privacy.

ActiveSync 3.1

<http://www.microsoft.com/mobile/pocketpc>

If you're using a Pocket PC or an older Windows CE device, you can update to the latest version of Microsoft's ActiveSync (click Downloads and ActiveSync 3.1). Version 3.1 includes support for USB synchronization in Windows 98, 2000, and Me.

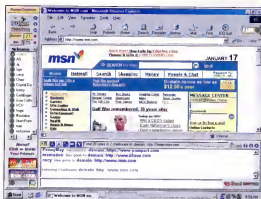
That's News To You

Finding the appropriate Usenet discussion group to match your interests can be a monumental task. Each month, we scour the tens of thousands of newsgroups and highlight the newsgroups that delve into popular topics. If your ISP (Internet service provider) doesn't carry these groups, ask it to add the groups to its list. This month we honor April Fools Day with a smattering of humorous groups.

alt.shenanigans If you believe every day is April Fool's Day or at least every day should be, then this is your kind of newsgroup. Posters submit ideas and ask advice for various shenanigans. The group is all about good-natured fun; pranks that look to hurt others or damage personal property are discouraged.

alt.humor.best-of-usenet For every five people clogging

Usenet with spam and questions already answered in the group FAQ, there's one person who contributes something worthwhile to the group, even if it is nothing more than a few clever wisecracks. This group contains the funniest posts from around Usenet.



Share The Wares

Some of the best apples in the online orchard are the free (or free to try) programs available for download. Each month we feature highlightings from our pickings.

ICQ Surf 1.11

ICQ is one of the more popular instant messaging systems. The problem is, instant messaging can be very lonely when you feel like chatting but none of your friends are online. With ICQ Surf, ICQ users can pass the time chatting online with complete strangers who happen to be viewing the same Web site. The software creates two chat rooms: one for users who are viewing the same page as you (<http://dmoz.org/Arts>, for instance) and another for users visiting other pages under the same domain name (<http://dmoz.org>). In the upper-right corner of your browser, you'll see a count of other users visiting the same domain. Double-click the counter to bring up a list of other users. You can type messages to everyone in the chat room or use the list to send an instant message to a particular individual in the user list. ICQ Surf requires ICQ version 99b beta 3.16 or newer. The software runs on all Windows later than Windows 95 and is free to use.

Total Recorder 3.0.1

It isn't always easy to save streaming media files to your PC. Some sites, for instance, may not let you save content to your hard drive (this is typically the case with live radio broadcasts, for instance). Total Recorder lets users record any sound played back on their PC regardless of if it comes from a CD or a streaming audio broadcast. The software is easy to setup and configure, and it includes a scheduler that lets you schedule recordings for any time of the day or night. In order to save recordings as an MP3 file, you'll have to download additional software and configure Total Recording to use the new software. A nice feature

is that Total Recorder edits out any pauses you might encounter if your streaming audio pauses to rebuffer. The evaluation version is limited to 40-second recordings, and it costs \$11.95 to get beyond that limit. Total Recorder requires Windows 95 and newer. ■

ICQ Surf 1.11 lets you view a list of other ICQ Surf users who are visiting the same Web sites. You can chat publicly with other users or send an instant message using ICQ.

Obeying Moore's Law

In 1965, Gordon Moore, eventual co-founder of Intel, introduced what would become one of the chief axioms of the computer world. It began as an observation made in a paper Moore wrote while working for Fairchild Semiconductor. The press dubbed the

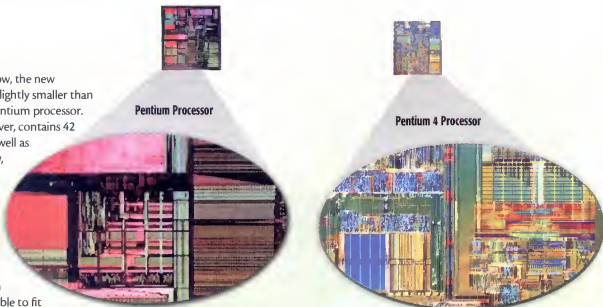
observation Moore's Law, and nearly 36 years later everyone with an interest in computers has heard of Moore's Law.

The definition of Moore's Law thrown about most often today is that processor speeds double every 18 months, but that isn't completely accurate. According to

Intel, it is more precise to say Moore's Law states that the number of transistors you can fit on a sliver of silicon doubles every two years. As you'll see, smaller transistors do allow for faster processors, but Moore's Law doesn't refer specifically to processor speed.

Die Size

As you can see below, the new Pentium 4 die is just slightly smaller than that of the original Pentium processor. The Pentium 4, however, contains 42 million transistors as well as on-die cache memory, while the original Pentium processor contained "just" 3.1 million transistors and no on-die cache. As future generations of the chip move to a new design process, Intel will be able to fit even more transistors on even smaller bits of silicon.



Pentium
Processor Width

Pentium 4
Processor Width

Transistor Size

Although Moore's Law does not specifically mention processor speed or power consumption, these properties do benefit from smaller transistors. Smaller transistors require less energy to operate, which in turn leads to cooler operating temperatures that allow manufacturers to increase clock speeds (measured in MHz). Transistor size is not the sole determinant of processor speed, however. Materials used to construct processors also play a role.

Copper, for instance, is a better conductor of electricity than the aluminum Intel currently uses. Because less resistance means less heat, expect clock speeds to go even higher when Intel makes the switch to copper.

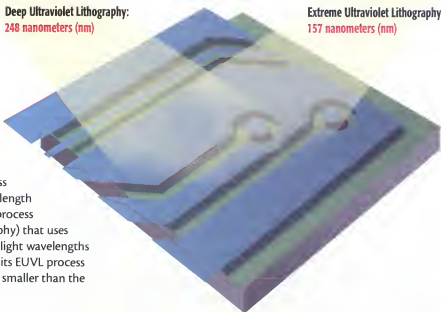
Beyond Moore's Law

Gordon Moore certainly didn't think in 1965 that Moore's Law would last as long as it has, but he now feels it will continue to hold true through at least 2017. When current technology finally hits the wall, it will be up to new technologies such as DNA or quantum computing to pick up where the transistor leaves off.



Deep Ultraviolet Lithography:
248 nanometers (nm)

Extreme Ultraviolet Lithography:
157 nanometers (nm)

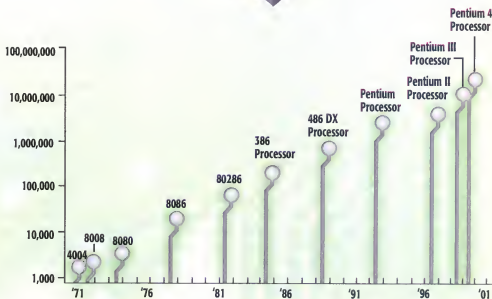


Lithography Process

Lithography is the process of using a special light to draw transistor pathways on a silicon wafer. Intel's current lithography process uses DUV (Deep Ultraviolet) light with a wavelength of 248 nanometers. Intel is working on a new process known as EUVL (Extreme Ultraviolet Lithography) that uses a wavelength of only 157 nanometers. Smaller light wavelengths allow for smaller transistors, and Intel believes its EUVL process will allow it to create transistors 100,000 times smaller than the thickness of a sheet of paper.

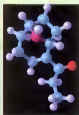
Staying The Course

As this graph indicates, Moore's Law has remained constant throughout Intel's lifespan. Notice how the number of transistors listed on the left grows exponentially.



Quantum Computing

Quantum computing delves into the odd world of quantum mechanics and uses sub-atomic particles called qubits as a basis for computation. Qubits, like traditional bits, can represent either 1 or 0, but they can also represent both 1 and 0 simultaneously. This means quantum computers will perform multiple sets of calculations at once, making them even faster than today's supercomputers.



DNA Computing

Scientists have already used DNA molecules to perform complex calculations and solve real-world problems, although leaders in the field have run into both practical and theoretical roadblocks. In 1994 the inventor of DNA computing, Leonard Adleman, demonstrated how the billions of molecules in just a drop of DNA could in theory outperform silicon supercomputers.



Carbon Nanotubes

Carbon nanotubes are extremely small, often less than a nanometer across. By comparison, the latest transistor technology is 18 nanometers in size. Conventional materials become too weak to reliably conduct electricity when they get too small, but nanotubes are incredibly strong and have successfully delivered electricity over short distances. They also don't create as much heat as current transistors.



*Need help with your hardware or software?
Looking for simple explanations on technical subjects?
Send us your questions!*

Windows 95/98:

Q: *I installed Windows Millennium Edition and it does not have the Compression Agent that previous versions had in the System Tools menu. I want to compress my hard drive to make room for more games. Can you tell me where I can download Compression Agent or suggest an alternative?*

A: WinMe no longer uses the Compression Agent utility that Windows 95 and Windows 98 users have used for years to compress files on their hard drives. It does include the DriveSpace 3 compression utility that works with Compression Agent, but only for use in decompressing previously compressed removable storage media (diskettes, Zip disks, etc.) so WinMe can read files stored on them. WinMe doesn't give you the option of using DriveSpace on your hard drive. This may be due in part to the fact that many WinMe PCs ship to retail with their hard drives formatted to use the FAT32 (Microsoft's 32-bit file allocation table) file system, which doesn't get along with DriveSpace.

You should be aware that one of the downsides to disk compression is that it can slow disk access somewhat, a side effect you're particularly likely to notice while playing PC games (which are often accessing large image files from the hard drive). For more information, see "Using Drive Space & Compression Agent" from Learning Series: How To Use Windows 98, February 1999, Vol. 5, Issue 2. Also, with the price of 20GB hard drives down below \$100 and not-that-ancient "small" 2GB drives being cleared out under \$50, it hardly pays to mess around with disk compression.

However, if you must use compression, another route to getting more space might be to get a copy of ZipMagic from Ontrack (\$39.95; 800/645-3649; 952/937-5161; <http://www.ontrack.com/zipmagic>). It works with FAT32 and with WinMe, and unlike the more popular WinZip, ZipMagic lets you compress entire folders

and – here's the best part – have them appear as perfectly normal folders. You can open, view, and copy them just like you would with uncompressed folders, much like you could with DriveSpace. We'd suggest using it selectively to compress folders where fast access isn't a critical issue, such as your word processor document folder, folders of images you don't use often, the Temporary Internet Files folder, etc. Note that WinMe itself has a similar feature called Compressed Folders, but we think ZipMagic is more flexible and easier to use.

Q: *The Windows Me story starting on page 26 of the December issue says, "WinMe hides the menu choices you don't select often." I have Windows Me installed, and I don't want it to hide any menu choices. I have looked for a way to turn the feature off, but can't find one. Can you help?*

A: To turn WinMe's Personalized Menus feature off, click the Start button, point to Settings, and click Taskbar And Start Menu. In the Taskbar And Start Menu Properties dialog box, look for the Use Personalized Menus option near the bottom. If there is a check mark in the box, click the box to remove it, then click OK.

Keep in mind this won't turn off the Personalized Menus feature found in current versions of Internet Explorer and Microsoft Office. To disable it in Explorer, click the Tools menu, click Internet Options, then click on the Advanced Tab in the Internet Options dialog box. In the Browsing section, locate the Enable Personalized Favorites Menu option and click the box next to it to remove the check mark.

To turn it off in Office 2000 applications such as Word, Excel, and Access, click the Tools menu and click Customize (or right-click an open area of the toolbar and click Customize). Click the Options tab in the Customize dialog box that appears, then click the box next to Menus Show Recently Used Commands First to remove the check mark, and click the Close button.

We should point out that some of our writers find this feature very useful; it takes a little getting used to, but we'd suggest you give it a chance. Remember that the Personalized Menus feature doesn't take menu options away; it just displays the items you use most to make navigation more efficient. If you need a menu item that is hidden, you can easily display the hidden portions of any Windows, Office, or Explorer menu by clicking the double arrows at the bottom. You can also display hidden commands by letting your pointer hover over the partial menu for about 3 seconds, and the hidden items will appear.

“...The Personalized Menus feature doesn't take menu options away; it just displays the items you use most to make navigation more efficient.”

Utilities:

I just purchased a new PC, and I need to transfer all the files from my old machine onto the new one. Is there a simple and reliable way to transfer files to the new machine other than using diskettes and without the complexity and expense of network cards?



Moving files to a new system can be simple or complex, depending on what you need to move, your skill level, and the tools you choose. If you only need to move one folder of word processor documents and maybe an e-mail address book, it can be simple. Other transfers can get very complicated, particularly if you want to get all your data and configuration settings (Internet dial-in numbers, etc.) over to a new machine. There is always a danger of either leaving something important behind, or copying something over from the old system that messes up or disables the new system. Moving files between computers with different operating systems compounds these difficulties, and for these and other reasons we've written entire articles on the subject (see "Moving Into A New PC: Tips For Taking Your Data With You" from Smart Computing, October 1998, Vol. 9, Issue 10).

The good news is that yes, there are many reliable ways available to you aside from creating a network. For starters, there are several storage mediums you can use besides diskettes, like Zip drives, tape drives, Orb drives, and others. A second option (if you're not talking about too many files or too much data) is to e-mail the files to yourself from your old computer, and retrieve them using the new one. This method can be time consuming, however, and some users might not be able to use it because of the size limits some ISP (Internet service providers) put on their customers' mailboxes.

A third (and much faster) option is to transfer your files from computer to computer using a special cable known as a laplink cable (a parallel cable with two male ends and designed to facilitate bi-directional communication between two computers). You can configure your computers to share information using Windows' Direct Cable Connection utility, or purchase a special software package for the job like Traveling Software's LapLink (<http://www.laplink.com/>).

But wait, there's more. Acer and various other computer equipment companies offer a special transfer cable called USB (Universal Serial Bus) Data Link that connects to the USB ports of both computers and comes with its own software for about \$40. It functions much like an older version of LapLink (it displays one Explorer-like file window on one computer and a second, corresponding pane on the other), but it's much faster.

And for more advanced users, one of our favorite data transfer methods is to temporarily (or permanently, if you prefer) install the hard drive from the old computer into the new one and drag and drop files and folders from the old drive to the new drive. If you're not comfortable installing and removing your PC's internal components, many computer stores or service centers can do it for you, sometimes for a reasonable fee.



I have been trying unsuccessfully to print my BIOS settings by pressing the PRINT SCREEN key. This used to work on my older computer, which ran DOS and Windows 3.1. Now I run Windows 98, and it won't work. How can I make Windows print out the BIOS screens?



Preserving a copy of your BIOS (Basic Input/Output System) settings is a good idea, but the ability (or lack thereof) to print what you see while examining the BIOS setup screens has nothing to do with either DOS or Windows. When you bring up your BIOS setup screens, you keep your operating system (whether DOS, Windows, or other) from starting. Your computer's willingness to print these screens when you press SHIFT-PRINT SCREEN depends upon the BIOS software your computer uses, and (not surprisingly) your printer (some printers lack the ability to print properly without help from Windows).

You may have to either hand-copy your BIOS settings, or use a utility program such as Norton System Works (\$59.95; 800/441-7234; 541/334-6054; <http://www.symantec.com>), Fix-It (\$49.95; 800/645-3649; 952/937-5161; <http://www.ontrack.com/fixit>), or other utility that includes a BIOS capture function. These allow you to save the BIOS settings to disk and/or print them out.

Also, check with your motherboard's manufacturer; some companies provide free utilities that let you store backup copies of your BIOS settings on your hard drive.

Computer Hardware:

I remember reading somewhere that sometimes having only 64MB of RAM could make your computer run faster than having 384MB. The article suggested that any amount of RAM more than the amount your programs said they required was a waste of money. Do you subscribe to the buy-no-more-than-you-need school of thought or should I buy all the RAM I can afford?



It's true that you can reach a point of diminishing returns where memory is concerned. Six years ago most users reached that point at

16MB; today it's somewhere between 64 and 128MB. Users that need to run extremely resource intensive programs (or that need to run several programs simultaneously without experiencing performance degradation) may benefit from having more than 128MB. In most cases, though, users with more than that are probably serving only to stimulate the economy by spending more cash, while worsening the energy problem by drawing more electricity.

Furthermore, it really is true that having very large amounts of RAM, such as 512MB or more could potentially slow your PC down, because your CPU has to spend a larger amount of raw processing power monitoring and refreshing all that RAM. The performance hit would likely be very negligible, but paying extra for even the slightest reduction in overall performance is a bad investment.

In our experience, however, having inadequate or even moderate levels of RAM is far more detrimental. If your computer doesn't have enough RAM, it can't store sufficient data to keep pace with your CPU, forcing it to draw on the hard drive space Windows uses as "virtual memory," which is much slower. We strongly encourage getting a healthy supply of RAM. We'd also recommend not accepting the minimum RAM requirements printed on software boxes as the gospel truth. These numbers usually don't reflect the amount of memory you need to make a program run as it should, only to get it to run period. To quote Kingston Technology's booklet *The Ultimate Memory Guide*: "More is good; less is bad."

Granted, Kingston may not be the most objective source on this question, because it's in the business of selling RAM, but we're not, and we belong to the more-memory-the-merrier school as well. Adding RAM is frequently the single most cost-effective performance upgrade you can perform on your computer.

One way to tell if your PC would benefit from having more RAM is to open the two or three programs you use most frequently at the same time. Time some sort of key operation in one of them (for example, the redrawing of a figure in a graphics program) that is RAM dependent. Close down one or two of the other programs and time it again. If it runs faster with fewer programs open, you might benefit from a few more megabytes of RAM.

Online Communications:



I recently joined an e-mail discussion group serviced at <http://www.egroups.com>. For some time after I joined the group, the manager periodically sent me polite e-mail messages asking me to put my real name into my eGroups member profile. He said that I was registered in his

group with an e-mail address only and that the lack of a name made it difficult to administrate the group. Why would the group manager need to have my name? Is it dangerous to put my name in my eGroups profile?



E-mail lists (sometimes called e-mail forums or internet newsletters) can be very useful. They differ from another type of interactive group, called newsgroups, in that e-mail lists don't require you to have Web access to participate. Conversations just periodically drop into your e-mail inbox. eGroups is one of several services that offer free hosting of such e-mail lists, and the little snag you and the group manager ran into is common.

Before we get started on the specifics of your question, we should point out that in August, eGroups merged with Yahoo! Groups, so instead of looking for the service at <http://www.egroups.com>, users should now head to <http://groups.yahoo.com>. All of your group's information should have made the transition as well, so the only thing that will change is the Web address you visit when you're looking for more information. If you haven't updated your profile in a while, we'd recommend you head to the new site and link your eGroup accounts to Yahoo! Groups (there's a handy Link Your Accounts Here link near the upper left-hand corner just for eGroups members).

To answer your first question, there are many difficulties a group manager (or group owner) might have if members are only listed by e-mail address rather than by name and e-mail address. Some members may register with e-mail addresses that don't contain their names, such as firebirdlady@netservices.com. If they contact the manager about technical problems using a different e-mail address, it will be difficult for the manager to associate the problem with the correct member.

As to the second part of your question, if by "danger" you mean exposure to spamming and other unwanted attention, the answer is: possibly. Groups like yours usually have three levels of online access to lists of members' names and e-mail addresses. Some groups publish such lists so anyone on the Web can see them, while others have lists that only members can access; in the third scenario only the group manager has access to member information. It's a good idea to check with your group manager and find out how your group's contact list is set up.

Word Processing:



My copy of Microsoft Word seems to create copies of the documents I work on with names like ~WRL3156.tmp. They don't seem to be important, because I commonly delete

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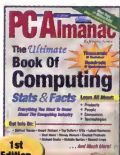


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them and as far as I know I've never suffered any negative consequences. If I don't search for and delete them periodically I end up with hundreds of them. While it's not a big problem, they do take up 1.5 to 2MB of hard drive space each, and files that big can add up eventually when you only have a 2GB hard drive. Can you tell me where they come from and if there's a way to get Word to clean up after itself?

A: You're correct that for the most part these files are unimportant. It's also not a bad idea to clean them out periodically, but if you delete them while Word is open you may corrupt the document you're working on. The .tmp files are copies produced periodically by Word both for backup and as scratch/working area. If a system failure or power outage corrupts the original document, Word is smart enough in most cases to locate the older (although usually recent) copy and offer to open it for you.

If for some reason you don't want Word to produce temporary files for backup, click the Tools menu, click Options, then click the Save tab in the Options dialog box. Then click the box next to Save AutoRecover Info Every: to remove the check mark. We don't recommend disabling this feature, however, as doing so removes a safety net you may one day be grateful for.

Word normally does a fair job of keeping the total number of spare copies and scratch (temporary) copies at a reasonable number. If they're accumulating, it may be because you're shutting your computer down without first exiting from Word, or because the computer is periodically locking up without letting Word go through an orderly shutdown.

Q: *Sometimes I copy and paste text from a Web page, e-mail, or other document into a document I'm creating in Word 2000, and it appears with some font or attribute (italics or color) that I don't want. I try to remove the unwanted formatting by highlighting the text and setting the style to Normal, and sometimes it works. Other times the text seems to hang on to its attributes, and I'm forced to go through the tedious process of manually resetting the font, size, etc. Is there an easier, sure-fire way to remove all formatting off a block of copied text?*

A: There may be some things you can do in Word to help ease this "sticky attribute" problem. One you might try is highlighting the text and pressing CTRL-Spacebar, the keyboard shortcut for removing text formatting. If you're particularly determined and have some spare time, you could create a macro that would walk through all the menu

commands you usually use to do a manual reset of each formatting attribute.

But rather than suggest further details on manipulating Word's formatting controls, we'll share with you an infallible trick that strips all formatting attributes from a block of text. We particularly like it because it's a method that works with any word processor and removes formatting from text you remove from any other program.

Copy the text you want to add to your document, then open Windows' Notepad application (click the Start button, point to Programs, point to Accessories, and click Notepad). Paste the text into Notepad, then cut or copy it from Notepad and paste it into your word processor document (or just about anywhere else, for that matter). All formatting attributes (font settings, italics, colors, etc.) will be gone, and the text will assume the default attributes for the program you're working in.

Miscellaneous Software:

Q: *I want to experiment with Outlook's Journal feature, but I can't find the command or icon to get started. Help was less than helpful, or perhaps I wasn't asking the right question. Can you help?*

A: Outlook's Journal is a feature that some people swear by, and that doesn't come with Outlook Express. You can use it to keep track of letters you write using Microsoft Word and e-mails you send with Outlook. Journal remembers whom they were for, when you sent them, and what they were about, and records this information in one central journal so you don't have to search your hard drive or tax your memory (your human memory, that is). Keep in mind that in order to be effective, the journaling feature has to monitor the opening, closing, and saving of every document you create. All that electronic nosiness can slow down the opening and closing of files a bit.

To access the Journal feature, launch Outlook, click the Tools menu, and click Options. Click the Journal Options in the Contacts section of the Options dialog box, and select the features you want to activate and which applications you'd like to keep tabs on. ■

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Answers to users' most common questions.

Surge Protectors, Suppressors, & UPSes

FAQ: *Where do power surges and other fluctuations in the flow of electricity come from?*

Lightning strikes can send millions of volts through telephone and power lines, resulting in blown transformers and fried computer components, but most power fluctuations aren't so severe. More often, the flow of electrical current decreases (called a brownout or sag) and increases (called a spike or surge) slightly for a variety of rather more mundane reasons. Inadequate or faulty wiring can cause such fluctuations, as can devices such as air conditioners, battery chargers, copy machines, and fluorescent lights switching on or off. Even your utility company's own electrical equipment (transformers, etc.) can affect the quality of your electrical signal, causing line noise called EMI/RFI (electromagnetic interference/radio frequency interference).

FAQ: *How will such fluctuations affect my computer?*

The most dangerous type of power fluctuation is the power surge or spike. If it's powerful enough, a surge can destroy your computer's components, even if your system is turned off. Brownouts, blackouts, and EMI/RFI may not fry your modem or burn circuitry, but they can cause computer crashes and glitches in critical files.

FAQ: *What's the difference between a surge protector and surge suppressor?*

Manufacturers often use these terms interchangeably, but surge protectors and suppressors work differently and provide your computer with varying levels of protection. A surge protector contains a fuse that blows when it takes the brunt of an electrical surge, rendering it useless except for use as a power strip. Surge protectors are inexpensive, in some cases selling for less than \$10.

Surge suppressors, on the other hand, offer ongoing protection. They limit the magnitude of spikes and surges, and can do so repeatedly. Shunt mode suppressors, such as Tripp Lite's \$65 Isotel 8 Ultra Multimedia suppressor, work by routing excess voltage to a grounding wire. Series mode suppressors, such as Brick Wall's \$300 Series Mode 8R15AUD, absorb excess energy from a surge and slowly release it through your power lines once the electrical current fluctuation ends.

FAQ: *What's a UPS?*

A UPS, or uninterruptible power supply, automatically provides backup power to your computer for several minutes in the event of a power failure. They vary in price, features, and the level of protection they provide against electrical current fluctuations. Some, such as CyberPower's CP5320SL, sell for around \$50 and contain backup battery power and surge suppressor capability for modems and network connections. Other, more expensive models such as the \$120 Patriot 250 UPS from InvenSys Power Systems, have line-interactive technology that helps them regulate the flow of current to your computer. In other words, in addition to protecting against surges, they can actually boost current during brownouts or sags and maintain a steady, even flow of power at all times.

FAQ: *What specifications or features should I look for in a power suppressor or UPS?*

Look for a device with the highest surge capacity (the maximum amount of electricity the device can absorb) and the fastest response time to spikes and surges that you can afford. Because power surges can travel through telephone wires as well as electric power lines, be sure to get a device that includes jacks for your modem and/or fax connections. It's also a good idea to get a UPS or suppressor that lets you know when it is damaged (some power management devices continue to function normally as power strips even after a surge has damaged their ability to protect your computer). Finally, look for products with warranties that guarantee compensation should they fail to protect your computer.

FAQ: *How can I best protect my system from power fluctuations?*

UPS devices are handy for ensuring that your small-business computer continues to operate smoothly during brownouts, blackouts, and surges. However, if you're just looking to keep your home computer in working order and avoid high repair bills for fried components, a decent surge suppressor with at least a 400-joule surge capacity should do the job. Be aware, though, that repeated surges and spikes will eventually blow the fuse element in shunt mode surge suppressors. In addition, keep in mind that no protective device can prevent a power surge caused by a direct or extremely close lightning strike from entering and possibly damaging your computer. For that reason, it's still a good idea to unplug your electrical devices during severe weather. ■

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Rebate Headaches



In August 2000, I bought a Sony notebook from Best Buy in Concord, N. H. Best Buy offered a \$100 rebate so I mailed in the information the day I brought home the notebook.

After waiting for two months, I called the Best Buy rebate center and was told it hadn't received my information. I sent the information again (minus the bar code) only to have the unopened letter returned and marked "Offer Expired." I am now at my winter residence in Arizona. Is there anything I can do?

ROBERT G. DESPATHY, SR.
CAVE CREEK, AZ

On Dec. 19, 2000, we called the phone number on the rebate form and reached a woman at the Best Buy rebate center. According to its records, Robert's second rebate forms were returned because they lacked the necessary bar code, or UPC, from the notebook's box. Because the original UPC had been lost along with the first rebate forms, we asked what Robert should do. She advised Robert to return to the Best Buy where he bought his notebook and explain the situation. The store could either pay the rebate or issue a UPC code he could mail in for the rebate. Because Robert was in Arizona, we called the Best Buy store in New Hampshire and spoke to Doug Robinson, the manager. Robinson said Best Buy doesn't deal with third parties, but that Robert should go to a Best Buy near him to resolve the matter. We suggested Robert contact the closest Best Buy. After trying unsuccessfully to reach someone by phone and mail, Robert went to the store and received his \$100 rebate.



In July 1999, I bought a Monorail PC model 8370 from Best Buy. Shortly after I bought the unit, I contacted Monorail's customer service department with a question and was quite pleased with the quick assistance I received. I am now ready to upgrade and was wondering about the hard drive's speed. I've e-mailed the customer service department but get no response. When I called technical support, a message says it no longer provides phone support. I don't see Monorail computers anywhere;

does Smart Computing know anything about Monorail PCs?

DON JONES
LAS VEGAS, NV

We tried unsuccessfully to reach Monorail's corporate headquarters and sent a message to its public relations department on Dec. 22, 2000. On Jan. 2, 2001, Greg Adams, vice president of product development, replied, explaining at the end of 1999, Monorail changed its focus. It partnered with an established OEM (original equipment manufacturer) and no longer sells Monorail branded PCs, although it provides support for old Monorail PCs. It discontinued in-house phone support, but Don can still reach tech support at Monorail's repair depot at (973) 625-4056 extension 312 or online support at <http://www.monorail.com/support>. Adams says e-mail support is active and promised to look into the problems Don had with Monorail's e-mail support. Adams also says that Monorail's 8300 series all featured 5400 RPM hard drives.



In December 1999, I bought ScanSoft's TextBridge Pro 9.0. The software came with two rebates that covered the price of the software. I mailed the rebate information immediately but still have not seen my rebates. I haven't been able to reach anyone at the rebate center. Is there anything you can do?

MARGE LINGERFELT
SALOME, AZ

We decided to skip the rebate center and contact ScanSoft directly to find out what happened to Marge's rebates. On Dec. 6, 2000, Jane Van Saun from the ScanSoft media relations department contacted us followed by Amy Sullivan from ScanSoft. Sullivan got the ball rolling on the rebate check and told Marge on Jan. 2, 2001, that ScanSoft cut a check and mailed it. Despite the fact that Marge lives close to the rebate center, she didn't receive her check until Jan. 10, 2001.

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buffer—A section of memory built into CD-RW drives. When data is recorded to CD media, the information flows into the drive's buffer first and then is recorded to the media. This assures that the data will be recorded in a smooth, steady stream. If the drive's buffer empties before the recording is finished, the flow of data will be interrupted and a buffer underrun will occur, which will make the media unreadable.

burn—The process of writing data, music, or information to a CD-R or CD-RW.

drive rating—A numerical rating given to a drive to quickly indicate its data transfer rate. For CD drives, the drive rating is determined by dividing the drive's maximum data transfer rate, measured in kilobytes per second, by 150KBps. A CD-ROM drive with a maximum data transfer rate of 6,000KBps would have a drive rating of 40X ($6,000/150 = 40$).

FAT32 (file allocation table 32 bits)—FAT keeps track of the contents of a hard drive. FAT32 lets users store more data on hard drives and use bigger drives. FAT16 used 16 bits to address clusters, which limited the size of hard drives to 512MB, or 2GB if the drive were partitioned into four 512MB partitions. FAT32 supports drives as big as 2TB (terabytes). FAT16 uses 32KB clusters to store data; FAT32 uses only 4KB. This saves space because a 33KB file in FAT16 requires two 32KB clusters or 64KB of hard drive space, while the same 33KB file in FAT32 requires only nine 4KB clusters, or 36KB of space.

full-stroke access time—The time it takes a CD-ROM or DVD drive to read from the outermost track to the innermost track, which helps gauge the drive's performance.

IEEE 1394—Known to Macintosh users as FireWire, this high-speed, external

bus specification is used to connect computer peripherals. The bus is optimal for peripherals that demand high external bus speeds for bandwidth-consuming multimedia, such as digital cameras, digital VCRs, and DVD players. IEEE 1394 boasts transfer speeds of up to 400Mbps (megabits per second) and can handle up to 63 devices. Other benefits include Plug and Play, hot-swapping, and support for a constant transmission speed, which is appropriate for streaming audio and video content because it doesn't handle changes in speed well.

nonvolatile—A type of flash memory that retains the data even when not connected to its power supply.

overclocking—Changing a computer system's hardware settings so it runs at a speed faster than what the manufacturer rated it to run.

PostScript—A page description language program created by Adobe. Because of its great flexibility in type, as well as graphics, PostScript has become the standard in desktop publishing.

random-access times—The time an optical drive needs to find a random piece

of information on the media. Random-access time is an important performance indicator for optical drives.

SCSI (Small Computer System Interface)—(Pronounced *scuz-zee*.) A standard for parallel interfaces that transfers information at a rate of up to 80MBps (megabytes per second). You can attach up to seven peripheral devices, such as a hard drive and CD-ROM drive, to a single SCSI port on the system's bus. SCSI ports were designed for Apple Macintosh and Unix computers, but also can be used with properly equipped PCs.

Wired Equivalent Privacy—A security algorithm in the 802.11 wireless standard. WEP uses RSA Data Security's RC4 stream cipher to encrypt a transmission with either a 40-bit or 128-bit key.

XMS (extended memory specification)—Determines how a 286-based or higher computer can use extended memory and the high memory area in DOS, requiring the use of the EMM (expanded memory manager) driver. Extended memory extends the operating system's reach beyond the first megabyte of memory, while the high memory area is the first 64KB of that extended memory.

New Terms

blackhat—A hacker looking for monetary gain, such as from cracking secure e-commerce servers and absconding with credit card information.

clickstream—The trail of clicks a user makes as he or she travels through the online world. Many Web sites

have links or online banner ads to other sites on their pages, so as a user moves from one Web site to another using these links, the user creates a trail showing where he or she has been. Advertisers can track these mouse movements using specially designed software.

MMC (MultiMediaCard)—A very small solid-state flash memory module invented by SanDisk and Infineon. At .06 inches thick by .94 inches wide by 1.26 inches long, the MMC can fit in devices too small for CompactFlash or SmartMedia cards.

Communicating With Your PC

Icons Today, Voice Rec Tomorrow

WHILE DISPLACED DOT-COMMERS AND MARKET-CHASTENED venture capitalists frantically search for the "next big thing," those of us in the trenches who use computers every day know what we really want. Forget about wireless widgets and pie-in-the-sky Web commerce sites. Just give us an interface that makes all this digital stuff easier to use.

That's easy to say, we know. For years, software and hardware companies have nurtured usability labs and coaxed feedback out of focus groups. They've watched behind mirrored walls while people used their products and then talked to them about what worked and—more importantly—what didn't. Sure, they've had some great successes. But they've had their Bobs and Newtons, too. (For those of you not familiar with those products, you didn't miss much. Bob was a miscalculated attempt from Microsoft to appeal to new computer users that ended up being more patronizing than practical; Newton was Apple's early attempt at a voice recognition device that, unfortunately, didn't recognize voices.)

Visionaries such as David Gelemtier, professor of computer science at Yale, foresee the day when we don't have to dig through files and folders to find what we want. Instead, the "computer" (or whatever device we are interacting with) does the grunt work for us, delivering whatever information we need, whenever we need it. Michael Dertouzos, director of MIT's Laboratory of Computer Sciences, writes eloquently about "ubiquitous computing," a future scenario where we are never cut off from information because computing power is embedded everywhere: our homes, our cars, our clothes.

We agree that these wondrous days are coming—but they aren't here yet. Visions of effortless, anytime, anywhere data access from an all-encompassing network are a bit much when we have enough trouble trying to decipher Windows error messages in standalone PCs. Don't get us wrong: We know there are wonderful times ahead. We laud the companies and institutions that are conducting the research of today so we can have a better tomorrow. But please, let's not raise everyone's hopes too high for overnight miracles.

Don't promise we can do something when we can't. Give us working products, not works in progress. Don't show us commercials of people effortlessly videoconferencing around the globe on handheld computers when we know that's not yet possible. Don't raise our hopes with promises of computers that recognize facial expressions or hand gestures, when we know those technologies are still in the infant stages of their development.

One technology that has been dangled in front of users for the last decade is voice recognition. We know that voice recognition really will be a major force in the next few years. In fact, we think voice rec may be one of the biggest developments on the computing horizon. But it's not here quite yet. According to *EE Times* reporter Charles J. Murray, car manufacturers recently acknowledged the current shortcomings of voice interfaces and are

now resorting to the more pedestrian, but useful, notion of knobs for manipulating in-car computing features. We applaud that practical move. Don't give up on your research; we want voice rec, too. Just don't deliver it too soon.

This year we will enjoy (or endure, depending on whether you're an optimist or a pessimist) new releases for the Windows and Macintosh operating systems. Both Microsoft and Apple are reportedly tinkering with innovative developments that will enhance the interfaces of their software. These new features will have a far more immediate, and significant, impact on our daily computing than fresh-off-the-chalkboard research projects. Let's hope that both Microsoft and Apple are making the kinds of adjustments that truly will make computing easier for all of us.

Yes, it will be nice in the future when you can just talk to your computer. We look forward to the day when clicking on little pictures seems as antiquated as typing arcane strings of gibberish into a command line. Until that day comes, however, we'll gladly settle for plain-English dialog boxes, icons we can recognize, controls that have labels, help menus that aren't mazes, error messages that offer solutions, and procedures that make sense. ■



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